

UNITED STATES DISTRICT COURT
EASTERN DISTRICT OF VIRGINIA
ALEXANDRIA DIVISION

-----X
UNITED STATES, et al., : Civil Action No.:
 : 1:23-cv-108
 :
 : Plaintiffs, :
 :
 : versus : Thursday, September 19, 2024
 : Alexandria, Virginia
 :
 : GOOGLE LLC, : Day 9 p.m.
 : Pages 1-153
 :
 : Defendant. :
-----X

The above-entitled bench trial was heard before the
Honorable Leonie M. Brinkema, United States District Judge.
This proceeding commenced at 2:00 p.m.

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Deposition Read-In - B. Bradbury

1 (The deposition of Bo Bradbury is read as
2 follows:)

3 Q Next under the engaged phase, would you prescribe -- we
4 already -- you already talked about video and social. The
5 next one is online display. Can you tell me what that
6 includes?

7 A Certainly. Again, this would be more of what you might
8 want to consider your kind of traditional Internet or web
9 advertising of messaging typically in a static form, which
10 is then providing some call to action or a link through to a
11 designated -- typically, a page or home page, if you will,
12 or airforce.com, airnationalguard, a corresponding website,
13 etc. So somewhere capturing interest.

14 And then if -- if we're doing a good job of
15 intriguing the individual, they access that unit and then
16 pursue more information at another destination.

17 Q And so that would include, like, banner ads?

18 A It would.

19 Q Does it include native ads? What about rich media
20 adds.

21 A Display -- I think technically you could -- could
22 probably consider that under, really, video. But yes, I
23 think as we look to deliver video, it's agnostic whether
24 that is in a digital sense or a streaming sense. But
25 certainly, from a technical perspective, you could probably

Deposition Read-In - B. Bradbury

1 serve a rich unit or a video unit through display. Yes,
2 ma'am.

3 Q Well, maybe I should have asked this question first:
4 What does rich media mean to you?

5 A From my perspective, ma'am, I would say some element of
6 motion, whether that is animation, actual playing a video
7 asset within a unit, or maybe some interactive element. If
8 there is essentially kind of maybe a gamification aspect
9 within a display, some level of -- in its crudest
10 description, motion interactivity.

11 Q So, Mr. Bradbury, you've just walked me through the
12 different open auctions, programmatic guaranteed, and
13 private marketplaces. And I was starting to ask you how --
14 what are the various ways -- whether there are various ways
15 that GSD&M purchases display advertising on behalf of the
16 Air Force?

17 A For the Air Force, we primarily, if not exclusively,
18 use DV360, and some display may technically go through
19 Google AdWords. But there's advantageous tactics, reasons
20 for using that from an Air Force perspective.

21 Q Okay. I see you've got under tactic -- it says engage
22 for the first four and then recruit for the bottom two. And
23 then the next one over says media channel. And can you read
24 me the different media channels used for the engaged tactic?

25 A Yes. For engaged tactics, media channels supporting

Deposition Read-In - B. Bradbury

1 our YouTube, DV360, Snapchat, and Meta.

2 Q And those -- what does it mean for them to all be
3 listed here as the media channel for an engaged tactic?

4 A Their presence in this list denotes that they were
5 leveraged concurrently in pursuit of the objectives of this
6 particular task order and initiative.

7 Q And what are the objectives of this particular task
8 order?

9 A Engagement with the Air Force brand.

10 Q So these were used in order to obtain the same
11 objection of engagement?

12 A Yes. Yes. In my view, yes.

13 Q Is there a benefit to an advertiser of using multiple
14 different channels to achieve an objective?

15 A Yes.

16 Q And what are some of the benefits of having a mix of
17 channels?

18 A Certainly. There is great bodies of research over many
19 years showing that the multiplicity of channels actually can
20 provide greater impact for the brand, whatever the brand is,
21 in terms of awareness, recall, positive reactions to
22 communications.

23 Q Does -- do the channels that will be -- will best reach
24 a particular audience vary depending on the specific
25 campaign?

Deposition Read-In - B. Bradbury

1 A Yes.

2 Q In what way?

3 A Well, the audience -- a campaign is constructed for an
4 audience, and that audience may be dramatically different
5 from one campaign to another. Therefore, you're speaking to
6 different individuals who have different habits, practices,
7 and preferences. And so the answer to your question is,
8 yes, those could be different.

9 Q Do different channels reach different audiences based
10 on which types of people interact with that channel?

11 A Yes.

12 Q For example, how does the audience in a social media
13 channel compare with an audience on the open Internet, for
14 example?

15 A Those could be similar, but they could be quite
16 different depending on the nature of that particular
17 platform. So, for instance, if -- let's start using your
18 example. If it's a social media setting that is connected
19 to it and an affinity group of some sort tightly, that
20 audience may be very focused on that particular area of
21 interest versus the open web whereby its definition is
22 speaking to many, many more people. While some of them may
23 share that same affinity, there will be certainly others who
24 do not share that affinity. So it would be a specificity of
25 audience in those instances that would be different.

Deposition Read-In - B. Bradbury

1 Q And do the differences in audience and for a particular
2 social media avenue versus the open web, does that affect
3 how GSD&M would recommend one channel over another for a
4 given campaign?

5 A Yes.

6 Q Can you think of an example with respect to Air Force
7 where you would recommend a display for a particular
8 objective where you might not recommend social media or some
9 other channel?

10 A Yes. Let me think of an appropriate one here. Say,
11 for instance, a specific example being one of the -- what we
12 would refer to as a specialized career. For instance,
13 within the Air Force, health professions for instance. We
14 have the ability via display to reach individuals who we
15 think may be interested in potentially serving in that
16 capacity, in a medical capacity in the service. And we
17 would be reaching individuals who either have expressed
18 through some data signal an interest in health profession,
19 or the site itself may be medical careers related or
20 something. And we would appear there, recommend appearing
21 there versus, say, for instance, going to Facebook or
22 Instagram where it may be less of a potential connection.

23 Q It could. Would -- are there circumstances in which
24 you would recommend doing programmatic media buying rather
25 than doing a direct deal with a particular publisher?

Deposition Read-In - B. Bradbury

1 A Yes.

2 Q What are some of those circumstances?

3 A If, for example -- one variable would be scale, would
4 be an important factor to consider. If the marketing
5 objective is requiring a broad reach or exposure to a
6 message, then scale becomes important. Therefore,
7 programmatic is an attractive vehicle given its ability to
8 reach many, many particular audience sets.

9 A direct publisher, as you cited, can still be
10 very beneficial, but it becomes a matter -- typically, it
11 comes at a lower scale. And so those are kind of the
12 balances of -- that we are assessing in our media.

13 Q Would it be more costly to do advertising across
14 hundreds or thousands of websites via a direct deal?

15 A I believe so.

16 Q What would make it more costly?

17 A Two factors in my mind. I think there would be the
18 cost of administering and executing them. As you cited,
19 doing direct deals with individual parties would require
20 time, talent, labor, if you will, to do that.

21 Also, inefficiencies in performance may come into
22 play there because the data variables and audience
23 understanding of certain platforms varies versus others. So
24 the ability to target perhaps as discreetly as you would
25 like can vary by publisher.

Deposition Read-In - B. Bradbury

1 Q Is it important for GSD&M's clients to have access to
2 both digital display advertising on the Internet, as well as
3 social media?

4 A Yes.

5 Q Why is it important for Air Force and other advertisers
6 to have access to both of those different channels?

7 A Audiences may favor one channel, if you will, over
8 another would be one factor. So the audience that a brand
9 or client is pursuing may be more prevalent in one of those
10 avenues than another. So that would be one reason.

11 Another would be as -- again, back to the power of
12 a combination, a mix if you will, where a presence of a
13 message in multiple communication forms has greater
14 likelihood of being -- creating an impact and being seen.

15 So there would be a benefit to be in both
16 channels, so to speak, using that terminology.

17 Q Are there times on a given campaign where it's
18 necessary for an advertiser to shift from one channel to
19 another based on what they're seeing in terms of campaign
20 success and key performance indicators?

21 A Yes. I would also add that -- and maybe shifts within
22 the channel.

23 Q So does the use of the KPI cost for engagement for
24 different media channels within, say, a single campaign mean
25 that those media channels are essentially interchangeable?

Deposition Read-In - B. Bradbury

1 A I would not characterize them as interchangeable.

2 Q Why not?

3 A From an audience consumption perspective, they may use
4 those potential two platforms separately, and different
5 individuals may have a preponderance to one over another.
6 So there may be some overlap between those, but they could
7 have reached discreet audiences and, therefore, have some
8 use cases where you would not consider them interchangeable
9 per se.

10 Q Are there particular -- can you think of any examples
11 of particular use cases where programmatic online display
12 advertising is particularly useful for Air Force campaigns
13 in particular?

14 A Yes.

15 Q What are some of those examples?

16 A Instances where there are, again, hard to reach
17 audiences, where there may be unique data signals that are
18 important us to or easier to follow, find and follow in a
19 programmatic setting than in a direct publisher type
20 environment. And then combined with that would be the scale
21 in which to reach them as well.

22 Another benefit would be, in a programmatic sense,
23 is again thinking about approaching an engagement into a
24 display universe, so to speak, and a common point of entry
25 via DSP. There is a typically greater data -- data quality

Deposition Read-In - B. Bradbury

1 in terms of frequency and exposure, meaning that you have
2 greater confidence in the data you're sending of how often
3 the audiences are seeing a particular message as that is
4 beneficial for a brand and an agency and so forth in that we
5 are able to implement what's referred to as frequency
6 capping. We can determine how much advertising someone is
7 seeing and be judicious. And when we've hit the levels we
8 want, know that we've reached those and saved dollars
9 potentially for the client.

10 So those are some top of line examples in my mind
11 where that would be advantageous.

12 Q Right. So is there an advantage to open web non-walled
13 garden display advertising with respect to the breadth of
14 reach across different kinds of audiences?

15 A Yes. There's advantage, and that advantage would be
16 scale, access to a value, an audience which may be of
17 importance to an advertiser.

18 Q Are there some circumstances where direct and
19 programmatic buys can be used to achieve the same goals?

20 A Yes.

21 MS. AGNEW: That's it. Thank you, Your Honor.

22 THE COURT: All right. Thank you.

23 MS. WOOD: The next deposition will be of a Google
24 witness, Mr. Cox. We'll hand out the binders.

25 THE COURT: All right.

Deposition Read-In - B. Bradbury

1 MS. WOOD: We also have a set of exhibits pursuant
2 to our stipulation with Google that we would like to enter
3 in connection with the Cox testimony.

4 THE COURT: All right.

5 MS. WOOD: Those are PTX 429, PTX 438, PTX 452,
6 PTX 502, PTX 631, and PTX 712.

7 THE COURT: All right. Those are all in, correct?
8 Ms. Dunn, there's no objection?

9 MS. WOOD: And, yes, we will redact the comments
10 pursuant to our practice. One of the exhibits has the
11 comments on the side, and we will redact those.

12 THE COURT: All right. They're all in.

13 Which exhibit has the comments? Do you know
14 offhand?

15 MS. DUNN: PTX 429.

16 THE COURT: All right.

17 MS. DUNN: And PTX 712.

18 THE COURT: Now the Court doesn't need to even see
19 those comments; they're just out, right?

20 MS. WOOD: Understood, Your Honor.

21 THE COURT: So the only version that goes into the
22 record, which will also be publicly available is -- I am
23 going to still call it a redacted version, but that's how
24 we'll handle that.

25 MS. WOOD: Understood, Your Honor.

Deposition Read-In - S. Cox

1 THE COURT: That's fine.

2 MS. WOOD: All right. Are we ready?

3 THE LAW CLERK: (Nods head up and down.)

4 (The deposition of Samuel Cox is read as follows:)

5 Q You started working for Google in May 2016; is that
6 correct?

7 A That is correct.

8 Q All right. Let's talk a little bit about what you did
9 in your four-and-a-half years with Google. Am I correct
10 that you were a group project manager?

11 A Yes.

12 Q Were you sometimes --

13 THE COURT: Let me stop you for one second. For
14 the record, this is Samuel Cox.

15 MS. WOOD: This is Samuel Cox.

16 Q Were you sometimes referred to as the lead for DRX
17 buy-side?

18 A Yes, I was.

19 Q And what is DRX?

20 A DRX is Google's ad server and ad exchange.

21 Q And can you help the jury understand what you mean by,
22 quote, display inventory, closed quote?

23 A Anything that is pictographic and static.

24 Q And that --

25 A That could --

Deposition Read-In - B. Stewart

1 Q I'm sorry.

2 A That could also include video. So basically, anything
3 that is pictographic.

4 Q And do you distinguish between instream or out-of
5 stream-video?

6 A We did make that distinction, yes.

7 Q And what is that distinction?

8 A Instream video is within the stream of a show or a
9 piece of content whereas outstream is a video ad running in
10 what is normally a static placement.

11 MS. WOOD: That's it for that one. We will now
12 read Ms. Stewart, Bonita Stewart.

13 (The deposition of Bonita Stewart is read as
14 follows:)

15 MR. LIU: Are you ready?

16 THE LAW CLERK: (Nods head up and down.)

17 Q Can you spell your name for the record, please?

18 A Yes. It's B-O-N-I-T-A, and the last name is Stewart,
19 S-T-E-W-A-R-T.

20 Q Do you know what an on-the-record chat is?

21 A Yes.

22 Q What is it?

23 A It's when the history is recorded on a chat.

24 Q Have you ever marked a chat as, quote, on the record,
25 unquote?

Deposition Read-In - B. Stewart

1 A No, not intentionally.

2 Q What is your current position at Google?

3 A I am the vice president of global partnerships at
4 Google.

5 Q Do others at Google describe your position in any terms
6 other than your formal title?

7 A Head of our publisher partnerships.

8 Q How long have you been the vice president for global
9 partnerships with responsibility for large publisher
10 partnerships in the United States?

11 A Since October of 2012.

12 MR. LIU: That's all, Your Honor.

13 MS. WOOD: And the next deposition is of George
14 Levitte, who is a former Google employee.

15 And we do have certain exhibits to move in in
16 connection with his testimony pursuant to our stipulation
17 and with no objections, as I understand it, from Google.
18 They are PTX 507, PTX 786, PTX 882, PTX 945, and PTX 1021.
19 I believe PTX 882 may have some double-hearsay. But again,
20 those would not be offered for the truth of the matter but
21 simply for context.

22 MS. DUNN: No objection, but 786, 882, 945, and
23 1021 all have the same comments, and I assume the
24 government will redact those comments.

25 MS. WOOD: We will handle those accordingly.

Deposition Read-In - G. Levitte

1 THE COURT: All right. That's fine.

2 MS. DUNN: The only other flag, Your Honor, is I
3 understand portions of this testimony are sealed. So one
4 portion by Google, two portions by the plaintiffs.

5 MS. WOOD: In the version that I have, I believe
6 those may have been further narrowed and are no longer here.

7 THE COURT: Now, you've given me the complete
8 deposition.

9 MS. WOOD: Only for your reference, Your Honor.
10 All we are seeking to actually admit for purposes of the
11 record is that first tab that has the designation digest.

12 THE COURT: All right.

13 MS. DUNN: And that's with respect -- just for
14 clarity of the record, that's with respect to all of the
15 read-ins.

16 MS. WOOD: Yes, for all the read-ins. The first
17 tab contains what we're proposing for the record. The full
18 deposition transcript is just for reference if issues come
19 up.

20 THE COURT: That's correct. All right.

21 (The deposition of George Levitte is read as
22 follows:)

23 Q Good morning, Mr. Levitte. How are you doing today?

24 A I'm good. Thank you.

25 Q Sure. So let's start before the reorg. Before the

Deposition Read-In - G. Levitte

1 reorg, what were your responsibilities as a PM?

2 A When I started at Google, I worked on what we then
3 called the AdX buy-side, which was to provide functionality
4 and tools for third-party demand sources who are integrating
5 with our auction.

6 Q Did you work with any other products besides AdX?

7 A Yes. I worked with a number of Google's display ads
8 products in that -- while I was in that role.

9 Q Which products did you work on that were successful?

10 A That were successful? So some of them are described in
11 this LinkedIn document. So ads.txt was successful. That
12 was a -- something I created. Exchange bidding, which we
13 later called open bidding is something that I worked on
14 which has been successful.

15 Q And how do you measure success?

16 A Sometimes it's hard to measure success. Sometimes
17 there are easy metrics. Sometimes there aren't easy
18 metrics.

19 Ads.txt, for example, was designed to solve a
20 fraud problem in the industry. So it was at the time very
21 common that someone would sell ad inventory in a misleading
22 way that misrepresented the quality of the inventory, and
23 buyers would be fooled into buying low quality inventory
24 when they thought they were buying high quality inventory.
25 It was hard to know exactly how big the scale of that fraud

Deposition Read-In - G. Levitte

1 was, but we believed it happened a lot. Ads.txt was
2 designed to make it much harder for people to do this sort
3 of thing and thereby to limit the amount of fraud in the
4 industry.

5 It's a little bit hard to measure exactly how
6 successful that was. But one way of measuring would be to
7 see the percentage of properties that contain ads.txt, the
8 percentage of ad queries where there is a valid ads.txt.

9 So for each project, we do our best to come up
10 with metrics that describe success acknowledging that
11 sometimes it's very difficult to really specifically
12 quantify something when there are some unknowns or things
13 that are happening outside of your -- you know, our system.

14 Q Do you have a rough sense of how many impressions go
15 through exchange bidding.

16 A I have a rough sense that it's roughly about a billion
17 dollars in annual run rate, but I don't know how many
18 impressions. If you were to assume, you know, a dollar --
19 you could either assume a certain CPM and then back out a
20 rough number of impressions, but I don't -- I haven't been
21 monitoring it very clearly. So I don't have the latest
22 stats, but I'm sure those are available.

23 MS. WOOD: And then counsel identifies a document.
24 It is PTX 796, but we're not seeking to admit that as part
25 of this.

Deposition Read-In - G. Levitte

1 THE COURT: All right.

2 Q And how are you familiar with this document?

3 A This is a document that I wrote in preparation for
4 going for a promotion, I believe, in 2018.

5 Q And there you wrote, quote, build and led strategic
6 DFP/AdX effort to launch and scale an HB alternative more
7 favorable to Google (fees, data, control, user latency) as
8 defense against long-term threat posed by HB.

9 Do you see that?

10 A I do, yes.

11 Q Exchange bidding is more favorable to Google than
12 header bidding with respect to fees?

13 A I'm sorry. Are you asking me?

14 Q Yes.

15 A Yes, it is.

16 Q Can you explain why that's so?

17 A With exchange bidding, we take a percent media fee.
18 Oftentimes it's 5 percent. With header bidding, we take an
19 ad serving fee. It ranges, but it might be like a two cents
20 CPM.

21 Q Going back to what you wrote here, is exchange bidding
22 more favorable to Google than header bidding with respect to
23 data?

24 A Yes.

25 Q Can you explain why that's the case?

Deposition Read-In - G. Levitte

1 A One of the things that we do as a platform for
2 publishers is that we help them to manage their yield, and
3 we provide optimizations to help them earn the most money.
4 In the example of exchange bidding, because the bids are
5 flowing through our platform, that data can be used in that
6 way to help the publisher with those optimizations.

7 With header bidding, the publisher doesn't get the
8 same benefit of our optimizations being able to help them in
9 the same way, in part, because the data isn't available to
10 us to use in that way for them.

11 Q And what specific data does Google see in exchange
12 bidding that it doesn't see in header bidding?

13 A So there's bid data. So some of these optimizations
14 use the bid data that we get in a more precise way with
15 exchange bidding. There might also be troubleshooting data,
16 things that might, you know, help a publisher know if
17 something is going on.

18 Q When you say, quote/unquote, bid data, does that
19 include a price or a bidding price?

20 A Yes.

21 Q And you mentioned troubleshooting data. What's an
22 example of troubleshooting data?

23 A We have a feature called RTB breakout that illustrates
24 the end-to-end funnel for bidding into a system like ours.
25 And there are many ways in which errors might pop up that

Deposition Read-In - G. Levitte

1 could prevent a bid from entering the auction. But by
2 providing detailed troubleshooting information, we try to
3 help folks understand and figure out when something is going
4 wrong so they can correct it, the goal being to make sure
5 that all of these bids are able to compete in the auction.

6 Q Are those data that you use to help exchanges
7 troubleshooting issues that they have?

8 A Yes.

9 Q Can they also be used to help publishers?

10 A Sometimes it helps publishers as well, yes.

11 Q Today do you believe that header bidding poses a threat
12 to ad serving functionality of GAM?

13 A Still, I don't think header bidding is a competitor so
14 much as a technology. It's a type of technology, and it can
15 be used in all sorts of different ways. It facilitates
16 competition among different providers.

17 So I think a publisher still, you know, needs to
18 pick in the case of ad manager and a platform either their
19 own or someone from a third-party vendor to use. Header
20 bidding is a mechanism that can empower competition, but
21 it's not in itself a competitor, I don't think.

22 Q Did exchange bidding turn AdX's competitors into
23 customers?

24 A Yes.

25 Q How did it do that?

Deposition Read-In - G. Levitte

1 A Well, exchange bidding is a product for other ad
2 exchanges. So by participating in exchange bidding, they
3 are customers.

4 Q Did exchange bidding change your -- change AdX's
5 financial relationship with its competitors?

6 A It changed Google's financial relationship but maybe
7 not AdX's financial relationship. Exchange bidding -- the
8 exchanges don't participate in AdX.

9 Q How did exchange bidding change Google's financial
10 relationship with AdX's customers?

11 A Well, they became --

12 MS. WOOD: I'm sorry. I misread that.

13 Q With AdX's competitors?

14 A Well, they became our customers.

15 Q So they would buy ad inventory using exchange bidding
16 and pay us for --

17 MS. WOOD: Sorry.

18 THE LAW CLERK: I'll restart from that line.

19 A Well, they became our customers. So they would buy ad
20 inventory using exchange bidding and pay us for it.

21 Q So the exchange bidding participants would pay Google,
22 right?

23 A Yes.

24 Q And then Google would pass on the revenue minus
25 Google's fees to the publishers?

Deposition Read-In - G. Levitte

1 A Yes.

2 Q So the exchange bidding participants were no longer
3 directly paying publishers for impressions won in exchange
4 bidding?

5 A They continued to pay publishers directly for
6 impressions won by other channels, but for exchange bidding,
7 they would pay us for that. And then, as you described, we
8 would remit to the publisher.

9 Q Did exchange bidding change Google's data relationship
10 with AdX's competitors?

11 A Yes.

12 Q How did it change that relationship?

13 A Well, as we were discussing earlier, there are
14 optimizations that we would run -- that we run as part of
15 our service and other things we provide, such as
16 troubleshooting and reporting, for instance, all of which
17 use data, in this case, from exchange bidding demand. So
18 that's data that wouldn't have been in our system to use for
19 optimizations or troubleshooting or reporting that now is.

20 Q Did exchange bidding change Google's technical
21 relationship with AdX's competitors?

22 A Yes.

23 Q And how did it change that technical relationship?

24 A We built RTB integrations with these exchanges. So we
25 now send them bid requests when inventory is available to

Deposition Read-In - G. Levitte

1 notify them, and they will respond with a bid response.

2 Now, technical integration is fairly onerous and didn't

3 exist prior to exchange bidding.

4 Q Can you explain what made that integration onerous?

5 A It takes quite a lot of time and effort to set up a new

6 server-side integration. We've done a whole bunch of these

7 over the years, and it's very effort intensive. There are a

8 lot of things that can break, a lot of things that can go

9 wrong. So it's a staged process and entails a significant

10 investment of time and effort both on our part and on the

11 part of the bidder that's bidding into our system.

12 Q What do you mean by, quote/unquote, secret sauce?

13 A Apologies. This was a while ago, so my memory is a

14 little bit hazy. But I recall that there were times where

15 it was a little bit ambiguous how the AdX buy-side would be

16 allowed to use certain data that existed within Google.

17 And I think secret sauce in this context was a

18 term that was used to demark what sorts of things were data

19 reserved for Google's buy-side as opposed to, you know,

20 things that were okay to share with other parts of the

21 ecosystem.

22 Q Are you aware of any AdX feature being scraped or

23 scrapped because it infringed on the buy-side secret sauce?

24 A I think there were some features related to

25 cross-device where this was a tricky topic, the general idea

Deposition Read-In - G. Levitte

1 being that a cross-device graph was valuable intellectual
2 property. And we received that as guidance from our
3 executives that that valuable intellectual property they
4 desired to use for Google's buy-side but not to make
5 available to the AdX buy-side.

6 Q When you say a cross-device graph, are you referring to
7 tracking the same individual across multiple devices?

8 A It could mean across multiple devices or across
9 different browsers on the same device, for example.

10 Q So the strategy to increase gross revenue was to
11 increase AdX's share of wallet from DV360 and authorized
12 buyers?

13 A That was, I think, one of the strategies that was
14 listed in this table among others, yes.

15 Q And the share of wallet for DV360 is to increase AdX's
16 share of wallet from DV360 means that more of DV360 spend
17 goes to AdX?

18 A Yeah. For both DV3 and for authorized buyers. This
19 role basically says we'd like for them to spend more on our
20 exchange than they do presently, yeah.

21 Q And the tactic for this, as you wrote, 1p auction and
22 the Unified Pricing Rules?

23 A Yes.

24 Q 1p auction is the first-price auction?

25 A That's right.

Deposition Read-In - G. Levitte

1 Q So the change to first-price auction and Unified
2 Pricing Rules were a tactic to accomplish the strategy of
3 increasing AdX's share of wallet?

4 A I think this is maybe a simplified way, and I wouldn't
5 necessarily describe increase share of wallet as the goal of
6 these projects.

7 Q It was a strategy, right?

8 A One of the things that we wanted. So if I recall
9 correctly, I think this was a structure that would give us
10 some idea around a concept called input metrics and output
11 metrics where output metrics is something that you're trying
12 to achieve, like grow overall revenue. But you can't
13 necessarily control all of the things that result in gross
14 revenue.

15 Input metrics was, you know, sort of more concrete
16 objectives. So I'm not sure if strategy is the right way to
17 describe it, but one of the goals, among others, was trying
18 to get buyers to spend more on our exchange. Strategy might
19 not be the right way to put it.

20 MS. WOOD: Okay. We'll now read the testimony of
21 former Google employee Woojin Kim.

22 And we also have some documents, three documents,
23 in connection with Mr. Kim. They are PTX 794, PTX 1107, and
24 PTX 1108.

25 THE COURT: Any objection to those three?

Deposition Read-In- W. Kim

1 MS. WOOD: The first, 794, is pursuant to the
2 stip, and 1107 and 1108 relate to plaintiffs' motion for an
3 adverse inference.

4 THE COURT: Okay.

5 MS. DUNN: And just -- sorry. The Court's
6 indulgence, Your Honor.

7 (Counsel confer.)

8 THE COURT: Is there an issue?

9 MS. DUNN: I am just trying to clarify whether
10 these documents are the documents that were met and
11 conferred over last night. And subject to that, there's no
12 objection.

13 THE COURT: All right. They're in then.

14 MS. WOOD: Again, this is the deposition of Woojin
15 Kim taken on March 30, 2021, and it's Woojin, W-O-O-J-I-N,
16 last name Kim, K-I-M.

17 (The deposition of Woojin Kim is read as follows:)

18 Q When did you leave the role with Google Display
19 Network?

20 A I left the Google Display Network team, I believe, in
21 February of 2017.

22 Q What was your title while you held the role with the
23 Google Display Network?

24 A At the end -- by the end of my tenure there with Google
25 Display Network, I was director of product management.

Deposition Read-In- W. Kim

1 Internally, senior director of product management.

2 Q How many advertisers did GDN or Google Ads have?

3 A I count in the millions.

4 Q What type of businesses did you target as potential
5 customers for GDN?

6 A Businesses from all different industries really, and as
7 I said, we tried to build a truly flexible offering that
8 allowed advertisers to do a lot of different things. So no
9 particular industry sector in mind, global as well, a lot of
10 different advertisers.

11 Q So if I was a small business, a mom-and-pop shop like
12 you said, and I wanted to spend just a few thousand dollars
13 a year on display advertising, would I be a customer that
14 GDN would be seeking?

15 A We would certainly welcome them.

16 Q But GDN was designed so that it could be used by a
17 mom-and-pop shop who only wanted to spend a few thousand
18 dollars a year for display advertising. Is that correct?

19 A We certainly built our product to be flexible enough
20 that it could be used by small advertisers, mom and pops,
21 that only had a few dollars to spare. But we were proud of
22 the fact that we built a platform that was powerful enough
23 also to be used by the largest advertisers. So we did try
24 to be quite inclusive in terms of advertisers we welcomed.

25 MS. WOOD: And then the deposition marked a

Deposition Read-In- W. Kim

1 document which is in the binder as PTX 579, and plaintiffs
2 would move PTX 579 into evidence.

3 THE COURT: Any objection?

4 MS. DUNN: No objection, Your Honor.

5 THE COURT: All right. It's in.

6 Q Do you recognize the document?

7 A I don't.

8 Q The title of the document in the first slide is, quote,
9 Media Review GDN/DBM Customer Segmentation and GDN Marketing
10 Refresh. Do you see that?

11 A Yes.

12 Q And the date is September 2015; is that correct?

13 A I see that.

14 Q Do you recall playing any role in preparing this
15 document?

16 A I don't remember.

17 Q Do you recall the purpose of this document?

18 A I don't.

19 Q Do you see the column with the title, quote, Target Use
20 Case, closed quote?

21 A Yes, I see that.

22 Q It says -- in the GDN row, it states, quote, most
23 effective starting point for display and as a turnkey media
24 solution, closed quote.

25 Do you see that language?

Deposition Read-In- W. Kim

1 A Yes, I see it.

2 Q Turn to the next page with Bates ending in 510.

3 A Okay.

4 Q On the right side of the page, the slide lists four
5 segments of buyers; is that correct?

6 A I think that's right with different segments.

7 Q It lists four categories, correct?

8 A Correct.

9 Q Do you think that those four categories were a complete
10 and accurate way to categorize the advertisers that use GDN
11 or DBM?

12 A Is it a complete way to do it? Like I said, this is
13 probably one way of segmenting it. We do it different ways.

14 Q Do you see in the top right corner, there's color
15 coding for quote, DBM focus, and, quote, GDN focus, close
16 quote?

17 A Yes, I see that.

18 Q But Bucket No. 3 is fully within the GDN focus; is that
19 correct?

20 A Bucket No. 3 seems to be shaded entirely gray, GDN.

21 Q And Bucket No. 2 is partially in DBM and partially in
22 GDN, correct?

23 A That's what I see in this graphic.

24 Q And Bucket No. 1 is almost entirely in DBM focus but a
25 small portion in GDN, correct?

Deposition Read-In- W. Kim

1 A At least the shading portions look that way.

2 Q Number 3 refers to non-agency subscaled, correct?

3 A That's what I see written here.

4 Q There it says, quote, smaller digital advertisers,
5 close quote?

6 A That's what it says, yes.

7 Q And they would be a focus only for GDN, correct?

8 A That's at least what this slide says.

9 Q What did GDN think?

10 A GDN certainly had small digital advertisers, smaller,
11 small, smallest digital advertisers. They're in our
12 customer base because, as I told you, we built GDN to be
13 flexible, to be used by a lot of different sizes of
14 advertising, types of advertisers. So they were certainly
15 within our customer set back then, and we didn't shy away
16 from servicing them.

17 Q Did GDN impose any minimum spending requirements on
18 advertisers?

19 A I don't think so.

20 Q So I want to focus on that time period before AWBid,
21 A-W-B-I-D, came into being. Were there any benefits to the
22 advertisers of GDN only buying through Google-owned
23 exchanges or Google-owned channels as I think you referred
24 to it?

25 A I believe so at the time.

Deposition Read-In- W. Kim

1 Q What were those benefits?

2 A So I remember -- again, this is -- you're talking about
3 a time period back before AWBid. So maybe 2014, '13, '15,
4 or before that. As I mentioned, publishers oftentimes would
5 list their inventory on multiple different network and
6 exchanges and pools of inventory even simultaneously.

7 And an advertiser buying from multiple different
8 DSPs or ad networks could -- there was always the risk that
9 they could be bidding for the same exact impression through
10 a multitude of channels and basically competing with himself
11 or herself in that auction. So that's one risk.

12 Another risk is the -- you know, we believed at
13 the time that -- you know, we thought we were
14 differentiating from our competitors in the display ad
15 business by making sure that we have a high-quality bar in
16 what types of publishers and what types of inventory we get
17 monetized with Google's advertisers and Google's demand,
18 meaning that there was a lot of publishers that couldn't
19 apply for AdSense or ad exchange, maybe even list their
20 inventory through AdSense and ad exchange. But we wouldn't
21 actually monetize because the content or the traffic was
22 low-quality, spammy bought traffic sometimes.

23 And so the other benefit that we offered we
24 thought was that we protected advertisers, Google
25 advertiser, GDN advertisers in this case, from potentially

Deposition Read-In- W. Kim

1 low-quality spam traffic out there and spammy publishers as
2 well.

3 MS. WOOD: And then another exhibit is marked,
4 which is in your binder as PTX 103, and plaintiffs would
5 move PTX 103 into evidence.

6 THE COURT: Any objection?

7 MR. ISAACSON: No objection, Your Honor.

8 THE COURT: All right. It's in.

9 Q Do you recognize this document?

10 A I don't.

11 Q In the next two sentences, you say, quote, if this is
12 the case, I would like to have GDN buy on all exchanges, not
13 just AdX, since all our competitors are doing so. We want
14 truly equal inventory access.

15 Do you see that?

16 A I do.

17 Q And that's referring to what we discussed earlier about
18 GDN buying on exchanges that were not owned by Google. Is
19 that correct?

20 A When it says, quote, GDN buy on all exchanges, end
21 quote, all exchanges is -- I take it seems to be referring
22 to the non-Google exchanges out there.

23 Q When you say, quote, truly equal inventory access,
24 close quote, what are you referring to there?

25 A I think it's referencing -- I'm just reading off the

Deposition Read-In- W. Kim

1 email. I think it's in reference to the previous sentence
2 where, quote/unquote, all our competitors are buying on all
3 exchanges.

4 So we want equal access to what those competitors
5 are doing. I think that's how I would interpret this email
6 sitting here.

7 Q And then the last sentence of that paragraph says,
8 quote, no, you cannot buy on other exchanges. That will
9 weaken the value proposition of AdX as a sell-side platform,
10 close quote.

11 Do you see that sentence?

12 A I do.

13 Q Is that something that was conveyed to you by others at
14 Google?

15 A I think this is, I guess, my crude -- my summary of the
16 conversation that I must have had with someone at Google, I
17 presumed.

18 Q Do you recall others at Google having the view that it
19 would weaken the value proposition of AdX as a sell-side
20 platform if GDN, meaning Google Ads, buys on other
21 exchanges?

22 A I believe that's what I must've thought through this
23 recollection recounted in this email.

24 Q So you thought someone else had Google had that view?

25 A It seems like it. That's what's written here.

Deposition Read-In- W. Kim

1 Q Do you have any understanding of why it would weaken
2 the value proposition of AdX as a sell-side platform if GDN
3 buys on other exchanges?

4 A I think it's -- I think it's AdX is using the same type
5 of logic that's conveyed in the previous paragraph. If AdX
6 has unique buyers, that's something that AdX would have as
7 an advantage to other platforms that don't have those
8 buyers.

9 Q Were there also groups who were in favor of launching
10 AWBid?

11 A Yes.

12 Q Who were in those groups?

13 A I was in favor of it.

14 Q And who else?

15 A My product managers and the people that worked in AWBid
16 were also presumably in favor of it.

17 Q So is it fair to say, then, that the GDN product
18 management team was in favor of AWBid while members of the
19 sell-side product management team were against it?

20 A I think there was -- I don't know if there were -- it's
21 possible that some folks within GDN actually did not want to
22 do it and vice versa. Some people on the sell-side might
23 have wanted. I think it depends on the individual really.
24 These are individual opinions.

25 MS. WOOD: We have one last deposition, Your

Deposition Read-In - M. Shaughnessy

1 Honor.

2 THE COURT: All right.

3 MR. PRITCHETT: Good afternoon. Chase Pritchett
4 for the United States. I'll be reading in the deposition of
5 Michael Shaughnessy from Kargo that's dated August 9, 2023.

6 THE COURT: Are there any exhibits being moved in?

7 MR. PRITCHETT: No, Your Honor.

8 THE COURT: All right.

9 (The deposition of Michael Shaughnessy is read as
10 follows:)

11 Q Can you please state your name for the record, please?

12 A Yes. Michael Shaughnessy.

13 Q Where are you currently employed?

14 A Kargo.

15 Q When did your employment at Kargo begin?

16 A In 2018.

17 Q Where were employed prior to Kargo?

18 A I was employed by a few companies, including Evite,
19 IAC, which was about.com, and Bauer Media.

20 Q Of those three companies, which would you consider to
21 be website publishers?

22 A All three.

23 Q At a high level, what is Kargo's business?

24 A Kargo is a business that transforms standard creative
25 and creates bespoke experiences for the largest advertisers,

Deposition Read-In - M. Shaughnessy

1 as well as the best publishers.

2 Q And what's your role at Kargo?

3 A I am currently the chief operating officer.

4 Q In our role at Kargo, how often do you interact with
5 publishers?

6 A Frequently.

7 Q Could you give me some examples of some of the
8 publishers that you interact with?

9 A Yes. We work with the largest publishers, which have
10 taken their magazine businesses and made them digital
11 businesses. So think of the Meredith and the Hurst. We
12 also work with digital first publishers, including Bustle
13 and BuzzFeed, and then we work with broadcasters, like CBS,
14 NBC, and Discovery.

15 Q Is part of Kargo's business offer a supply-side
16 platform?

17 A Yes.

18 Q So it's your view that Google is the dominant publisher
19 ad server on the market today?

20 A Yes.

21 Q And what, if any, effect has Google's position as the
22 dominant publisher ad server had on Kargo?

23 A It has influenced product and engineering investments,
24 learning and development opportunities for existing
25 employees so that they can manage relationships with their

Deposition Read-In - M. Shaughnessy

1 publishers. And it also influences the way that we deliver
2 our campaigns.

3 Q What, if any, effect has Google's position as the
4 dominant publisher ad server had on Kargo's ability to
5 innovate?

6 A We have had to build a lot of our infrastructure and
7 architecture around the Google ad server, which if anyone in
8 this room were to go on a publisher site, there is a high
9 likelihood that Google Ad Manager is on the publisher's page
10 and descending ad requests, that is, the ad server
11 delivering ads.

12 Q What effect has it had on Kargo's ability to innovate
13 that you've had to build a lot of your infrastructure and
14 architecture around the Google ad server?

15 A It has slowed down our ability to bring some of the
16 research and development we've done over the years to
17 advance the industry at the pace we would like.

18 Q Are there any other demand sources that publishers have
19 available that can bring the massive amount of demand that
20 Google's GDN brings?

21 A My understanding is no.

22 Q What's that understanding based on?

23 A My experience being a publisher.

24 Q Does Criteo in particular provide a substitute for the
25 massive amount of demand that's available on Google's GDN?

Deposition Read-In - M. Shaughnessy

1 A In my experience, no.

2 Q What's your basis for saying that?

3 A Being a publisher who analyzed demand sources and was
4 able to understand where revenues were coming from. That's
5 part of our top-line revenues.

6 Q Does Amazon provide a substitute for publishers to that
7 massive amount of demand in Google's GDN?

8 A Today, no.

9 Q And what's your basis for saying that today Amazon does
10 not provide that?

11 A Based on my understanding of the DSP landscape,
12 conversations that I have with advertisers and agencies, in
13 addition to the contributions of Amazon's transparent ad
14 marketplace, TAM, and the way it was configured into my ad
15 stacks at about.com, as well as our media.

16 Q Are you aware of any source of demand for display
17 advertising available on the market today that's a
18 substitute for publishers to the demand available in
19 Google's GDN?

20 A I am not aware.

21 Q Do you agree that if a publisher was to switch away
22 from Google's platforms, it would have to replace that
23 revenue that's offered through Google's platforms?

24 A It would be extremely difficult for a publisher to make
25 this change. And in the short term, it would create pain

Deposition Read-In - M. Shaughnessy

1 for the publisher's business.

2 Q Why would it be extremely difficult for a publisher to
3 switch away from Google's platforms?

4 A Because publishers are dependent on Google for every
5 facet of their business. So zooming out, Google use --
6 sorry, publishers use Google analytics when it comes to
7 analyzing their site traffic. They build their businesses
8 to surface their content within Google search. Publishers
9 are seeing decreased traffic from this platform because of
10 things like the answer box within search. Or snippets of
11 their content are surfacing there where they have less ad
12 opportunities.

13 So based on macro trends that are happening within
14 the industry, other components of the Google infrastructure
15 that influences their business, it would be very, very
16 difficult for fact-based publishers and journalists to have
17 their commercial teams move away from this demand source.

18 Q Why do you view the ad tech industry as important?

19 A I believe the ad tech industry is important because
20 there is a value exchange between content creators and
21 consumers, and it's really important to our democracy in
22 making sure there is fact-based information that is
23 accessible to all.

24 MR. PRITCHETT: Thank you, Your Honor.

25 MS. WOOD: Plaintiffs call Robin Lee.

Direct Examination - R. Lee

1 THE COURT: Now, this is your last witness?

2 MS. WOOD: Yes, Your Honor.

3 THE COURT: All right. Are we set?

4 ROBIN LEE, PLAINTIFFS' WITNESS, SWORN

5 DIRECT EXAMINATION

6 BY MS. WOOD

7 Q Good afternoon, Professor Lee. Can you please
8 introduce yourself to the Court?

9 A Good afternoon, Your Honor. My name is Robin Lee.
10 I am a tenured processor of economics at Harvard
11 University where I have taught undergraduate and graduate
12 students for the past ten years. Prior to that, I taught
13 NBA students at NYU.

14 I receive my BA, master's, and PhD in economics
15 from Harvard.

16 Q And can you spell your first and last name for the
17 record?

18 A R-O-B-I-N, L-E-E.

19 Q And how long have you been a professor?

20 A Fifteen years.

21 Q Can you please describe your research and scholarship?

22 A So my teaching and research is in a field economics
23 known as industrial organization, which studies the
24 functioning of markets in competition among firms.

25 Q Have you received any special recognition for your

Direct Examination - R. Lee

1 work?

2 A Yes. For example, I received The Econometrics
3 Society's Frisch Medal recognized as a top research award in
4 economics.

5 Q And let me put before you PTX 1778. We can put it on
6 the screen, but there's also a copy in exhibit order in your
7 binder.

8 THE COURT: Is that the CV?

9 MS. WOOD: Yes, Your Honor.

10 THE COURT: I assume there's no objection to 1778.

11 MR. ISAACSON: No objection.

12 THE COURT: All right. It's in evidence.

13 And in what field specifically are you offering
14 this expert?

15 MS. WOOD: Economics and industrial organization,
16 Your Honor.

17 THE COURT: Any objection, Mr. Isaacson?

18 MR. ISAACSON: No objection.

19 THE COURT: All right. He is so qualified. Let's
20 go.

21 BY MS. WOOD

22 Q So let's turn directly to work in this matter. What
23 was your assignment in this case?

24 A So my assignment had three parts: First, to determine
25 whether markets alleged by the plaintiffs are appropriate,

Direct Examination - R. Lee

1 relevant antitrust markets for examining Google's market
2 power and the competitive effects of its conduct. The
3 second part was to evaluate the extent of Google's market
4 power in these markets, and the third was to determine
5 whether Google's conduct related to these markets created,
6 enhanced, or sustained its market power, whether it harmed
7 competition and/or continues to harm competition, and
8 whether it resulted in material harm to customers and
9 consumers.

10 Q And did you reach opinions with respect to each part of
11 your assignment?

12 A I did.

13 Q And can you briefly describe your opinions regarding
14 market definition?

15 A So the first opinion related to market definition is
16 that publisher ad servers, ad exchanges, and advertiser ad
17 networks are all well-defined, appropriate, relevant
18 antitrust product markets for evaluating Google's market
19 power and the competitive effects of its conduct.

20 All of these product markets contain tools that
21 are used to transact open-web display advertising, as well,
22 both worldwide with limited exceptions and the United States
23 are appropriate geographic markets for each product market.

24 Q We'll obviously get more into the substance of your
25 opinion as we go. But before we do that, can you briefly

Direct Examination - R. Lee

1 describe your opinions related to market power?

2 A So Google possesses substantial and sustained market
3 power that is protected by significant barriers to entry in
4 each of the relevant markets. It has possessed that market
5 power in recent years and likely since at least 2015.

6 Q And with respect to your third assignment, can you
7 describe the opinions you reached regarding Google's conduct
8 and its effect?

9 A So Google has engaged in conduct comprising five
10 specific acts that has excluded competitors from
11 participating in the relevant markets and impeded their
12 ability to attract advertiser spending and publisher
13 inventory. These acts have also denied rivals scale further
14 harming their competitiveness. Now, these acts have harmed
15 competition and have enhanced Google's market power and have
16 also harmed customers and likely harmed consumers.

17 Q Now, before we get into the meat of your opinions, can
18 you tell us: When did you first begin working on this
19 matter?

20 A So I began working on this matter in the fall of 2019.

21 Q And can you describe the types of materials you have
22 reviewed over the course of your time working on this
23 matter?

24 A So I reviewed thousands of pages of documents produced
25 by industry participants, sworn testimony. I also reviewed

Direct Examination - R. Lee

1 public sources and academic sources, examined internal
2 Google experiments, expert reports submitted by Google's
3 experts, and also analyzed and performed analysis of over a
4 petabyte of data, a lot of data produced in this matter.

5 Q And what methods did you employ in evaluating those
6 materials?

7 A So I used accepted theoretical and quantitative
8 econometric techniques to evaluate the material. This is
9 both theoretical and quantitative methods paired with my
10 training as an industrial organization economist.

11 Q Now you mentioned that you applied quantitative methods
12 as well as your training and experience. Can you give the
13 Court some examples of the quantitative methods you used?

14 A So some examples include regression analyses, auction
15 simulations, market share calculations. And as I mentioned
16 before, I also examined internal Google experiments and
17 simulations.

18 Q So putting aside the Google internal experiments and
19 simulations, how many independent quantitative analyses did
20 you yourself perform?

21 A I performed approximately a hundred quantitative
22 analyses to support my opinions regarding market definition,
23 market power, and competitive effects.

24 Q And when you conducted these independent quantitative
25 analyses, what data did you use?

Direct Examination - R. Lee

1 A So I relied on data produced by Google and, in some
2 cases, data also produced by other third-parties or industry
3 participants.

4 Q Now, you also indicated that in certain instances, you
5 relied on analyses done by Google itself. How many
6 quantitative analyses of Google did you rely on?

7 A So I relied on approximately 20 internal Google
8 experiments and simulations.

9 Q And why would you rely on Google's own internal
10 experiments and simulations?

11 A So this is for at least two reasons:

12 First, there's evidence that Google regularly
13 relies on these experiments in ordinary course to evaluate
14 potential exchanges.

15 Second, Google has control over its own pricing
16 and the features of its products. So this allows it to
17 evaluate exchanges that have occurred or even exchanges that
18 may never have been implemented.

19 Moreover, these experiments allow Google to
20 isolate the effects of certain changes while holding fixed
21 other things in the environment, and that's an important
22 reason why experiments can be valuable more so than relying
23 solely on observational data or just looking at what's
24 happened in the past.

25 Q Now, I want to turn now to the first assignment, which

Direct Examination - R. Lee

1 was market definition. Can you explain to us what is the
2 role of market definition to an economist such as yourself?

3 A So market definition is a tool used to analyze
4 antitrust and monopolization claims. It helps to focus
5 attention on areas over which market power can be exercised,
6 and the competitive effects of the conduct issue are most
7 likely to manifest.

8 Q And you've also described market power. What is market
9 power as a economists use that term?

10 A So economists define market power to be the ability to
11 profitably charge prices above-competitive levels, which are
12 oftentimes measured by incremental or marginal costs, and
13 these are the additional costs to produce an additional unit
14 of a product.

15 Q So you said that market power is associated with
16 pricing and the ability to price above-competitive levels.
17 Are there acts other than pricing that can be indicative of
18 market power?

19 A Yes. So economists recognize that market power can
20 also be exercised by failing to maintain quality, product
21 variety, or innovation at competitive levels.

22 Q All right. Can you describe how -- what constitutes a
23 relevant antitrust product market?

24 A So for a monopolization claim, a relevant antitrust
25 product market represents a set of products over which an

Direct Examination - R. Lee

1 alleged or potential monopolist by controlling can exercise
2 significant market power. That is a single firm by
3 controlling the set of products could profitably price
4 significantly above-competitive levels because enough
5 customers would keep buying those products and not go
6 elsewhere.

7 Q And how do economists, such as yourself, go about
8 evaluating whether a given set of products constitute a
9 relevant antitrust product market?

10 A So the most common method, the method that I employ, is
11 known as the hypothetical monopolist test, abbreviated as
12 the HMT.

13 Q All right. And I want to talk now about the
14 relationship, if any, between market power and monopoly
15 power. How are those two things related, if at all?

16 A So it's important to note that market power is not
17 binary. It's not 1-0. It can vary both in degree and
18 duration. So in terms of monopoly power, as an economist,
19 my understanding is that monopoly power is a legal
20 conclusion that is typically supported by economic evidence
21 of substantial and sustained market power that is protected
22 by significant barriers to entry.

23 Q What do you mean by substantial and sustained market
24 power?

25 A So by that, I mean the ability to profitably charge

Direct Examination - R. Lee

1 prices significantly above-competitive levels. That is not
2 quickly eliminated by the entry or expansion of competitors.
3 Moreover, it persists long enough to meaningfully affect
4 competition.

5 Q So you also reference barriers to entry. What are
6 those?

7 A So barriers to entry refer to factors that limit or
8 display entry or expansion by potential competitors. And
9 when significant barriers to entry exist, market power can
10 persist and not quickly be eroded by competition.

11 Q Now, when you defined what you've found were three
12 relevant antitrust product markets, you said that each
13 involved tools used to transact open-web display
14 advertising. Can you please describe to the Court what you
15 understand open-web display advertising to mean?

16 A So by that term, I'm referring to display banner ads
17 shown to the websites of open-web publishers. And open-web
18 publishers are those web publishers who rely on products
19 provided by other third parties to sell display advertising
20 in contrast to walled garden providers with their own
21 integrated display ad tech tools.

22 Q And when was the first time that you recall hearing
23 those four words "open-web display advertising" used
24 together?

25 A So I recall hearing the term "open web" and "display

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1 advertising," but I don't recall hearing those four words in
2 that order prior to my work in this case.

3 Q And I want to make one question clear: Are you opining
4 that open-web display advertising itself is a relevant
5 product market?

6 A I am not.

7 Q And what is the product market as you understand it and
8 have opined on?

9 A So the three relevant product markets are tools that
10 are used to transact or can transact open-web display
11 advertising.

12 Q Now, how does open-web display advertising then fit
13 into the three relevant product markets as you've defined
14 them?

15 A Well, I think it's still important to understand why
16 open-web display advertising is distinct from other forms of
17 digital advertising because that explains why customers
18 would be willing to pay more than competitive prices for the
19 tools used to transact those advertisements.

20 Q And who are the customers that use tools to transact
21 open-web display advertisements?

22 A So the customers are advertisers and open-web
23 publishers.

24 Q So I want to talk about each one of those in turn.

25 Let's start with open-web publishers. How, if at all, is

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1 open-web display advertising differentiated from other forms
2 of digital advertising from the perspective of an open-web
3 publisher?

4 A So I think the most important way is that open-web
5 display advertising helps open-web publishers monetize parts
6 of their digital inventory. That is -- that would not be
7 suitable for other forms of digital advertising. For
8 example, a web publisher without an app or without video
9 content or social content wouldn't be able to rely on app
10 advertising, instream video advertising, social advertising.
11 But even a web publisher who might have those other

12 channels, they still would have these web impressions, web
13 display impressions they would want to monetize. If they --

14 Q Sorry to interrupt. But when you say monetize, what do
15 you mean?

16 A I mean sell for revenue. So if a web publisher had a
17 perishable web impression they didn't sell, well, they would
18 be giving up valuable revenue.

19 Q Now, for advertisers, how is open-web display
20 advertising different from other forms of digital
21 advertising?

22 A So from an advertiser's perspective, open-web display
23 allows them to reach users across a wide range of websites
24 accessing them at particular -- or at different points in
25 time. For example, a retailer might see a user put a pair

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1 of shoes in their shopping cart at macys.com and then target
2 them with an ad later when they're browsing the news of the
3 *New York Times* or checking the weatherer at weather.com.

4 Q And based on your review of the record, do advertisers
5 use open-web display ads in addition to other forms of
6 digital ads?

7 A Yes. Advertisers often use other forms of digital
8 advertising as well. Sometime it's to achieve different
9 complementary goals. For example, advertisers often use
10 search advertising alongside display advertising, but that
11 doesn't necessarily mean they are close substitutes for one
12 another. They often -- or seem to achieve different goals.

13 Q All right. We'll talk more about that in a bit.

14 But did you have occasion in connection with your
15 work in this matter to calculate the size of the open-web
16 display advertising marketplace?

17 A Yes. So from my independent analysis of the data, I
18 calculated in 2022, approximately \$24 billion were spent
19 through advertiser buying tools for indirect programmatic
20 auction open-web display ads. In addition, that year
21 another \$11 billion was spent on direct deals through
22 Google's DFP publisher ad server.

23 Q All right. So with that understanding, let's turn now
24 to the publisher ad server product market. What was your
25 opinion regarding market definition for publisher ad

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1 servers?

2 A So my opinion is that publisher ad servers for open-web
3 display is a well-defined, appropriate, relevant product
4 market. To reach that conclusion, I used the HMT.

5 Q And can you tell us: Did you reach an opinion as to
6 Google's market power in that market?

7 A I did. Google possesses substantial and sustained
8 market power protected by significant barriers of entry in
9 the publisher ad server market with DFP.

10 Q Now, you said that you used the hypothetical monopolous
11 test or HMT. Can you please describe to the Court: What is
12 the hypothetical monopolous test?

13 A So in a monopolization case, the HMT begins with a
14 product offered by the alleged monopolous. Here it would be
15 DFP provided by Google. And also, those products that would
16 likely impose the most significant constraints on that
17 product. Typically, you know, products that offer the same
18 features, that cater to the same set of customers. So here
19 it would be publisher ad servers, and that would form what
20 is known as the candidate market.

21 The HMT would then proceed to ask the question:
22 If a single firm owned all the products in the candidate
23 market, would this hypothetical monopolous be able to charge
24 prices significantly above-competitive levels? And if so,
25 it means enough customers are continuing to buy those

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1 products and not substituting to alternatives so that that
2 price increase would be profitable. And then the HMT would
3 be set to pass, and those products would be enough to form a
4 relevant product market.

5 Q So how did you go about applying the hypothetical
6 monopolous test to the publisher ad server market in this
7 case?

8 A So basically, I used the steps I outlined before
9 starting with DFP and other publisher ad servers and looking
10 at evidence that would support or determine whether one firm
11 owning all of those products could price significantly
12 above-competitive levels.

13 Q And can you give us a simple example of how the
14 hypothetical monopolous test might work with products we use
15 more often than ad tech tools?

16 A Sure. So one way of thinking about it is imagine
17 there's an isolated town and maybe a half a dozen gas
18 stations which are all competing with one another. Maybe
19 their pricing close to competitive levels or close to their
20 cost. And to evaluate whether there would be a relevant
21 product market for gas or gas stations, it would begin by
22 asking the question: If a single firm owned all of those
23 gas stations, could that single firm charge prices
24 significantly above-competitive levels?

25 Now, imagine this is an isolated town, so

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1 customers aren't driving somewhere else. It's still the
2 case that maybe some customers would start walking, taking a
3 bike, buying an electrical vehicle. They are all
4 substitutes to gas to some extent. But the relevant
5 question is is there enough substitution to those
6 alternatives so that a firm owning all of those gas stations
7 wouldn't find it profitable to raise prices
8 above-competitive levels.

9 Q So turning back to this case, what products, if any,
10 are excluded from a relevant product market?

11 A So the products that are appropriately excluded are
12 those that are not close substitutes to products within the
13 market. The ones that are excluded are not significant
14 enough competitive constraints to prevent a hypothetical
15 monopolous from exercising significant market power.

16 Q Now, are you familiar with something that is referred
17 to as the SSNIP or S-S-N-I-P test?

18 A I am.

19 Q And can you explain what the SSNIP test is?

20 A So apologies to the Court for using another
21 abbreviation. But the SSNIP stands for a "Small but
22 Significant Non-transitory Increase in Price." The SSNIP
23 test is another way of referring to the HMT because the HMT
24 evaluates whether a hypothetical monopolous could profitably
25 implement a SSNIP above-competitive prices.

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1 Q Now, is there such a thing in economics as a
2 quantitative application of the SSNIP test?

3 A So this notion of a quantitative SSNIP test is
4 sometimes used to refer to a particular version used in
5 merger cases where information about customer substitution
6 patterns is used to determine whether a hypothetical
7 monopolous could increase prices further above current price
8 levels, but that type of test isn't appropriate for this
9 case here.

10 Q Why do you say a quantitative SSNIP would not be
11 appropriate for this case?

12 A Well, that form I just outlined wouldn't be appropriate
13 because this is a monopolization case.

14 In a merger case, the concern is that the merger
15 would lead to prices that would increase above current
16 levels, the merger would cause prices to increase further.
17 And that's why the benchmark they use is current level
18 prices. You would look at how customers substitute away.

19 Now, in a monopolization case, the concern is
20 identifying a set of products that could be monopolized or
21 could have already been monopolized. That's why the
22 appropriate benchmark are competitive price levels, which
23 may not be current price levels.

24 Q And are there any considerations that economists follow
25 when deciding whether to apply a quantitative SSNIP test in

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1 the context of a monopolization case?

2 A So in addition to using different benchmark prices --
3 right, in a monopolization case, the appropriate benchmark
4 are competitive prices. Economists also recognize -- want
5 to be careful when you rely on customer substitution
6 patterns at current prices. And this is because of
7 something known as the cellophane fallacy. So the
8 cellophane fallacy refers to the idea that when a firm is
9 already exercising significant market power, it's already
10 increasing prices to a level at which there is going to be
11 significant substitution to alternatives. But those
12 alternatives aren't necessarily close substitutes to the
13 products in a candidate market where those products price
14 competitively. In fact, those alternatives haven't
15 constrained the exercise in market power to begin with.

16 Q Can you give us an example of the type of cellophane
17 fallacy that you're talking about?

18 A Sure. For this, let's go back to this example I gave
19 before with an isolated town and gas stations. You know,
20 imagine a single firm ended up buying up all of these gas
21 stations and started raising prices up to the point where
22 it's no longer profitable to raise prices anymore. Well, at
23 that price, maybe there's a lot of customers who are
24 walking, taking their bike, using mass transit. But that
25 doesn't mean gas stations isn't a relevant product market

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1 even know there's a lot of substitution elsewhere. It's
2 because that market has already been subject to the exercise
3 of significant market power.

4 Q All right. So in this matter, what evidence did you
5 consider in conducting the hypothetical monopolous test for
6 the publisher ad server market in particular?

7 A So both for this market and all the markets, I looked
8 at both qualitative or descriptive evidence and quantitative
9 evidence to value whether the HMT would pass.

10 And this evidence falls into two broad buckets.
11 In the first bucket, there's evidence that the products in a
12 relevant product market offer distinct features valued by
13 customers not provided by alternatives. This bucket also
14 includes evidence that industry participants, including
15 Google, recognize these products as distinct competing
16 against a different set of competitors.

17 The second bucket of evidence is known as direct
18 evidence of market power.

19 Q And what is that? What is direct evidence of market
20 power?

21 A So direct evidence of market power is evidence that
22 Google is already able to deviate significantly away from
23 competitive behavior. This includes evidence that Google is
24 already charging prices that are significantly
25 above-competitive levels or failing to maintain quality at

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1 competitive levels.

2 Now, it's important to recognize that direct
3 evidence of market power doesn't rely on having already
4 defined a relevant market, nor does it rely on market share
5 calculations.

6 Q Now, as an economist, why is direct evidence of market
7 power useful in assessing a relevant product market?

8 A It's very useful evidence because if a single firm in a
9 candidate market is already exercising significant market
10 power, then a hypothetical monopolous that owned even more
11 products would be able to as well. Put another way, if
12 Google is already exercising significant market power, then
13 a hypothetical monopolous would be able to as well.

14 Q So what conclusion did you reach as to whether the
15 publisher ad server market passed the HMT?

16 A I reached the conclusion that indeed it does pass the
17 HMT and hence forms a relevant antitrust product market.

18 Q So let's talk now about one of the items you said you
19 considered, which are features of publisher ad servers.
20 What are the key features of publisher ad servers that can't
21 be obtained through other tools?

22 A There are many features, but one of the most important
23 ones is a publisher ad server's ability to effectively
24 manage both directly sold and indirectly sold open-web
25 display advertisements for publishers.

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1 Q And are publisher ad servers used by Facebook or
2 Amazon? Would they be included in the publisher ad server
3 market for open-web display?

4 A They wouldn't be.

5 Q And why is that?

6 A It's because these products aren't available to
7 open-web publishers as an alternative. They wouldn't
8 constrain a hypothetical monopolous of publisher ad servers
9 for open-web display from charging prices above-competitive
10 levels because Facebook and Amazon's publisher ad servers
11 aren't available as alternatives to these customers, to
12 these open-web publisher customers.

13 Q What do you mean they're not available?

14 A They just aren't able to be used by open-web
15 publishers. They're not provided to them as an option.

16 Q So who does use Facebook and Amazon's publisher ad
17 server?

18 A Facebook does it for its properties, and Amazon does
19 for the Amazon publisher ad server.

20 Q Now, based on your review of the evidence, can
21 publisher ad servers serve other types of digital ads, let's
22 say video or app, besides open-web display ads?

23 A Yes, it's possible. For example, Google's DFP also is
24 able to transact app adds.

25 Q And is it unusual for a product in a relevant antitrust

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1 market to have the ability to perform functions outside that
2 product market?

3 A No, it's not.

4 MR. ISAACSON: I'm going to object. I think we're
5 now leaving his report behind.

6 THE COURT: I'm sorry?

7 MR. ISAACSON: I don't think this is in his
8 reports.

9 MS. WOOD: Paragraphs 258 to 260, Mr. Isaacson.

10 MR. ISAACSON: I appreciate the citation.

11 All right. Go ahead. Thank you. No objection at
12 this point.

13 THE COURT: All right.

14 MS. WOOD: Can we get the question read back.

15 (Question read.)

16 THE WITNESS: No, it's not unusual. For example,
17 going back to gas situations again, some gas stations
18 perform tire changes, replace your oil, sell potato chips,
19 but a gas station would still be part of a relevant product
20 market for gas.

21 BY MS. WOOD

22 Q And so if you were looking and assessing market power
23 for a gas station that sells gas, would you measure the
24 amount of their potato chip sales?

25 A No, I wouldn't. So I'll come to this, but when

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1 calculating market shares in this market, you would form
2 market power over gas sales. I wouldn't, as a starting
3 point, put potato chips in that calculation.

4 Q Okay. Let's talk now about the competitive restraints
5 that are available in the publisher ad server market. Did
6 you consider whether there were competitive constraints on
7 publisher ad servers that transact open-web display ads?

8 A I did consider alternatives. This includes other forms
9 of digital advertising insofar as those alternatives would
10 allow a publisher to move away from a publisher ad server.

11 I also considered building an internal publisher
12 ad server, sometimes referred to as self-supply as a
13 potential constraint.

14 Q And let me take each one of those in turn. What were
15 the other forms of advertising that you considered as a
16 potential competitive constraint on publisher ad servers for
17 open-web display?

18 A So I considered some of the ones I mentioned before, in
19 app, native advertising, including social or instream video.
20 I mentioned before that tools provided by walled garden
21 providers, like Facebook and Amazon, aren't available to
22 open-web publishers as alternative. And I also described
23 earlier why. An open-web publisher, regardless if they have
24 other forms of content, still would have these valuable web
25 impressions they would want to monetize or sell for revenue.

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1 And that's why an open-web publisher ad server is still
2 important to them, and those other alternatives wouldn't be
3 significant enough competitive restraints.

4 Q And you also mentioned you considered whether the
5 ability to build your own internal publisher ad server might
6 impose or not impose a competitive constraint on the product
7 market. What did you find in that regard?

8 A So I found that wouldn't impose a significant
9 competitive constraint.

10 Q Why not?

11 A And this is for two main reasons:

12 First, it's costly, and it's difficult to build an
13 internal ad server. Very few publishers have successfully
14 managed to do so. Even the *New York Times*, which is a large
15 publisher, had at one point their own internal publisher ad
16 server but came back to DFP.

17 The second reason is that a publisher building
18 their own internal publisher ad server would actually lose
19 access to real-time bids from AdX, which at the moment are
20 only provided to DFP.

21 Q Sir, you also mentioned earlier that one of the things
22 economists consider when looking at relevant product markets
23 is industry recognition. What did your analysis of industry
24 participants show with respect to the publisher ad server
25 tool market?

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1 A There are numerous documents I've seen, including those
2 from Google, that recognize publisher ad servers as
3 different products, differentiated from other ad tech
4 products. In particular, highlighting the important role a
5 publisher ad server plays in managing between direct and
6 indirectly sold display ads.

7 Q Now, you also mentioned that sometimes direct evidence
8 of market power can help define a product market. With
9 regard to DFP, did you examine any direct evidence of
10 Google's market power in the publisher ad server market?

11 A I did.

12 Q And what did you observe?

13 A So I think one of the most telling examples is DFP's
14 ability to degrade its quality or remove features without
15 losing too much business. So in 2019, Google implemented
16 the Unified Pricing Rules, which took away the ability for
17 publishers to use variable pricing floors. In a more
18 competitive environment, publishers could turn to
19 alternatives, and Google would be constrained in what it
20 could do.

21 Additionally, historically, Google placed
22 restrictions within DFP on how publishers could work with
23 rival ad exchanges. And for a long time, publishers weren't
24 able to run real-time auctions among many ad exchanges and
25 AdX. The industry actually had to go outside of DFP and

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1 create header bidding to bring that functionality, but at
2 the same time, even with header bidding, most publishers
3 still had to go back to DFP. And again, in a more
4 competitive environment, publishers would have other
5 alternatives that would have allowed them to run those
6 real-time auctions against one another.

7 Q And how does that lead you to conclude that it's direct
8 evidence of market power, DFP?

9 A So this is evidence that DFP has, in some cases,
10 provided quality below competitive levels or failed to
11 maintain quality at competitive levels.

12 Q So based on all the evidence you examined, what did you
13 conclude about the relevance of a publisher ad server
14 market?

15 A Again, I concluded that DHMP would pass for the
16 publisher ad server market and it forms a relevant product
17 market.

18 Q So let's talk now about Google's market power in that
19 market. What types of evidence do you consider in
20 determining whether a firm possesses market power?

21 A So probably -- I can think of three sets of evidence,
22 how to organize this. First would be this direct evidence
23 of market power that I already spoke to.

24 The second would be additional evidence that these
25 products -- or rather a product in a relevant market is

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1 significantly different from other alternatives in that
2 market. As well as other evidence that customers have
3 limited ability to substitute away when faced with
4 above-competitive pricing.

5 And the third category of evidence relates to the
6 structure of the market. This includes barriers to entry
7 and market shares.

8 MS. WOOD: So if we can, show Plaintiffs'
9 Demonstrative O.

10 BY MS. WOOD

11 Q Did you prepare this demonstrative?

12 A Yes.

13 Q And what does it show?

14 A So this demonstrative shows the different categories of
15 evidence that were used both for market definition and
16 market power. And in the middle, it shows how direct
17 evidence of market power, which doesn't rely on having to
18 find a market, can be used both for market definition and
19 for market power. And the other types of evidence I've
20 described are shown elsewhere in the chart.

21 Q Okay. So let's talk now about some of the --

22 MS. WOOD: You can put that down for now. Thank
23 you.

24 BY MS. WOOD

25 Q -- some of the barriers to entry in the publisher ad

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1 server market. Can you describe the evidence you evaluated
2 in that regard?

3 A Yes. So for barriers to entry, I think there are four
4 significant ones:

5 First would be the costs of building a new
6 publisher ad server or expanding it. Even Facebook, which
7 has relatively deep pockets, valued an entry into this
8 market and decided not to enter.

9 Second, there are costs of maintaining a publisher
10 ad server, continuing to run it. These are also meaningful.
11 There's been recent exit -- or there's been exit in the
12 publisher ad server market with Verizon and OpenX.

13 Third, there are large switching costs. So a new
14 entrant seeking to gain transaction and expand will have to
15 overcome switching costs of customers who may already be
16 using DFP.

17 My analysis of the data indicates that from 2018
18 to 2022, of the top hundred publishers who use DFP, only one
19 stopped using DFP during that time period.

20 And the fourth bucket -- fourth category relates
21 to Google's conduct, and this is, again, the conditioning of
22 real-time access to AdX -- sorry, the conditioning of access
23 to AdX -- sorry, one more time -- the conditioning of access
24 to AdX real-time bids to the use of DFP. So an entrant
25 publisher ad server wouldn't get access to those real-time

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1 bids.

2 Q Now, are market shares direct evidence of market power?

3 A No.

4 Q Why not?

5 A Well, they're considered indirect evidence of market
6 power. Market shares on their own are not determinative of
7 market power, and that's why I'm looking at market shares in
8 conjunction with all of this other evidence to inform a
9 conclusion of market power.

10 Q And did you analyze DFP's market share in the publisher
11 ad server market for open-web display?

12 A I did.

13 MS. WOOD: And I'd like to introduce PTX 1278.
14 This is Figure 108 from Professor Lee's report.

15 THE COURT: Any objection to that?

16 MR. ISAACSON: No objection.

17 THE COURT: All right. 1278 is in.

18 MS. WOOD: And, Your Honor, again, we will have
19 the unanonymized go in as 1278 and the anonymized would be
20 1278A.

21 THE COURT: All right. So 1278 and 1278A are in.

22 BY MS. WOOD

23 Q Professor Lee, can you tell us: What does figure PTX
24 1278 show?

25 A So this figure reports publisher ad server market

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1 shares based on both directly sold and indirectly sold
2 open-web display ads. It reports these shares for five
3 years, from 2018 to 2022. The top panel is worldwide. The
4 bottom restricts attention to U.S. publishers.

5 Q All right. We'll talk about the worldwide versus U.S.
6 shortly, but can you summarize what's shown here?

7 A Yes. So in the first row of each panel reports
8 Google's market share for DFP among the set of both direct
9 and indirectly sold open-web display ads. In 2022, Google
10 had a market share of 91 percent of these impressions and
11 maintained that 91 percent share over this five-year period.
12 In the U.S. in 2022, DFP had an 86.5 percent market share,
13 and for that five-year period, shares were always at that
14 level or above. For both worldwide and the U.S., this share
15 that DFP had was 15 times larger than the next closest
16 competitor.

17 Q Now, how, if at all, did you compute the shares that
18 are seen in this chart?

19 A So to compute these numbers, I relied on data produced
20 by Google, as well as other publisher ad servers.

21 Q Okay. And did you look at open-web display ads, or did
22 you look at all digital ads that are processed by DFP?

23 A Yes. Again, these are limited to open-web display
24 impressions but includes both directly sold and indirectly
25 sold transactions.

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1 Q So why did you not include impressions that DFP
2 processed if they were not open-web display?

3 A So the role of market shares in my analysis here is to
4 inform market power, to inform the ability of DFP to
5 exercise market power over customers seeking to transact
6 open-web display ads. And for that purpose, it wouldn't be
7 appropriate to include other types of transactions if those
8 customers aren't looking -- well, I'm -- sorry, it wouldn't
9 be appropriate to include those other types of transactions.

10 Q Why wouldn't it be appropriate to include them?

11 A Well, I think we talked about this before in an analogy
12 of gas stations. If I'm looking at the market power of a
13 gas station over retail gas, I wouldn't necessarily include
14 tire changes or oil changes or potato chip sales. Here, if
15 I'm focusing on the ability to exercise market power over
16 customers seeking to transact open-web display ads, I
17 wouldn't be including other forms of digital advertising.

18 Q Okay. And ultimately, what was your conclusion with
19 respect to DFP's market power in the market for publisher ad
20 servers used to transact open-web display?

21 A So Google with DFP possessed substantial -- or
22 possesses and sustained market power that's protected by
23 significant barriers of entry, and it has possessed that
24 market power in recent years.

25 Q So let's move to the second product market at issue,

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1 the ad exchange product market. What are the valuable
2 features of ad exchanges based on your review of the
3 material in this case?

4 A So ad exchanges allow open-web publishers to auction
5 off their remnant inventory to thousands of advertisers
6 without having to form individual direct relationships with
7 each and every one.

8 Q And who are the customers of ad exchanges?

9 A Both open-web publishers and advertisers.

10 Q So when you evaluate the ad exchange market, do you
11 consider substitution by both sets of customers, meaning the
12 advertisers and the publishers?

13 A I do.

14 Q And from an economic economist perspective, can a
15 relevant market exist for a set of ad tech products if one
16 side of the market can more readily substitute to other
17 products than the other side of the market is able to
18 substitute to other products?

19 A Yes. As long as one side of the market lacks close
20 substitutes and would be willing to bear above-competitive
21 prices to keep using those products, then the hypothetical
22 monopolous test would pass. And this would still form a
23 relevant product market.

24 Q So can you explain why that is. If advertisers have
25 lots of different substitutes but publishers don't, how does

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1 that matter in terms of assessing a relevant product market?

2 A So one way of thinking about this is imagine if --

3 let's say it's actually cost nothing to transact these

4 open-web display ads via auction. So advertisers would pay

5 a dollar per thousand impressions or a dollar CPM, and maybe

6 publishers would be paid out a dollar CPM.

7 Now, let's assume, contrary to evidence, that

8 advertisers actually have close substitutes. So advertisers

9 will never pay more than a dollar because if they get

10 charged more than a dollar, they'll go somewhere else.

11 Q So it's not a competitive constraint for them because

12 they will just choose somewhere else.

13 A They'll just go somewhere else, right. But if open-web

14 publishers are willing to accept less than a dollar because

15 they lack close substitutes, right. They have perishable

16 web impressions that they can't monetize some other way.

17 They might be willing to accept 90 cents, 80 cents, even

18 less per thousand impressions, which would allow a

19 hypothetical monopolous of these ad tech tools, like ad

20 exchange, to be charged a 10 percent, 20 percent, or even

21 more. It would be taken out of publishers get paid out

22 without charging advertiser anymore.

23 And that's why it's possible for market power to

24 only be exercised over one set of customers. However,

25 there's significant evidence that when fees are actually

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1 taken out by these ad tech products, it's actually borne by
2 both advertisers and publishers.

3 Q Now, earlier, I believe, you mentioned something
4 referred to as indirect network effect. What are indirect
5 network effects?

6 A So indirect network effects refers to when a product
7 value to one set of customers depends on the usage of that
8 product by another set. So for these ad tech products, like
9 ad exchanges, for publishers, an ad exchange is more
10 valuable because it's expected to deliver better yield when
11 more advertisers are bidding into it. And from the other
12 side, advertisers value an ad exchange more if there's more
13 access to publisher inventory, the more publishers are
14 selling impressions through that exchange.

15 Q And what did you find with respect to indirect network
16 effects in the ad exchange market?

17 A So although indirect network effects exists for ad
18 exchanges, they don't constrain the market power of a
19 hypothetical monopolous that's evidently shown by
20 Google's -- or direct evidence of Google's market power with
21 AdX.

22 Moreover, indirect network effects limit the
23 ability of a smaller firm to expand. That's because it has
24 to attract, again, both advertisers and publishers to
25 perform more transactions. And it's this chicken-and-egg

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1 problem that also serves to protect the market power of
2 Google and of a hypothetical monopolous.

3 Q You said the chicken-and-egg problem. What do you
4 mean?

5 A It's this idea that a product that has network effects
6 has to get on board with both publishers and advertisers,
7 and it's oftentimes seen as a significant barrier to entry
8 and expansion.

9 Q So I want to talk about the competitive constraints
10 that you considered with respect to the ad exchange market
11 for open-web display transactions. What products did you
12 consider in that regard?

13 A So for ad exchanges, I also considered other forms of
14 digital advertising. I also considered the possibility that
15 advertising and publishers could resort to using direct
16 deals as opposed to these auction deals. And I also looked
17 at ways in which advertisers perhaps could use DSPs through
18 these SPO or supply-path optimization products to bypass
19 exchanges and go straight to publishers or publisher ad
20 servers.

21 Q I want to talk about each one of those in turn. First,
22 other digital advertising formats other than open-web
23 display, what did you conclude as to whether those served as
24 competitive constraints on ad exchanges for open-web
25 display?

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1 A So I concluded that they would not serve as significant
2 enough competitive restraints to prevent the hypothetical
3 monopolous test for passing. And this is for the reasons I
4 discussed earlier.

5 For advertisers, there's significant value to be
6 able to advertise on open-web publisher sites, target users
7 across a wide range of websites. And from open-web
8 publishers' perspectives, again, they have web display
9 inventory that's not monetizable through these other
10 formats. Moreover, integrated walled garden tools aren't
11 available to those open-web publishers.

12 Q Now, did you consider whether a publisher's ability to
13 do direct deals with advertisers imposes a competitive
14 constraint on the ad exchange market?

15 A I did consider direct deals and found that they
16 wouldn't impose a significant enough competitive constraint.
17 This is because for many small open-web publishers, they
18 don't have the sales teams to actually generate significant
19 revenue from direct sales. But even for larger publishers
20 who might have direct sales, recall that programmatic
21 indirect open web emerges a way for these publishers to sell
22 the remanet inventory, the other inventory that wasn't
23 already locked up with direct deals. And as evidenced by
24 the widespread use of ad exchanges, this ability to sell all
25 that leftover inventory is really valuable.

Direct Examination - R. Lee

1 Q Now, did you perform any quantitative analysis to
2 examine the difference between direct deals and indirect
3 transactions on ad exchanges?

4 A I did. I looked at the relative price differences
5 between directly sold and indirectly sold open-web display
6 transactions.

7 Q And what did you see were the price differences when
8 the publishers negotiated directly with advertisers versus
9 when they sold through an exchange?

10 A So using data from DFP, I calculated that direct deals
11 sold on average for almost \$7 CPM or \$7 per thousand
12 impressions. Whereas indirect deals on average were a
13 bit -- a little bit above a dollar CPM.

14 Q What is that price difference of \$7 versus \$1 tell you
15 about the potential for competitive constraint?

16 A Well, that's a big difference, \$1 and \$7, and it's
17 evidence that these are significantly differentiated
18 products and publishers aren't able to easily substitute to,
19 you know, the more expensive products, right. If they
20 could, they would want to sell what they're selling for a
21 dollar for \$7. But they can't do that.

22 Q Now, you also mentioned something called supply-path
23 optimization and your consideration of whether that might
24 serve as a competitive constraint on ad exchanges
25 transacting open-web display. First, can you describe what

Direct Examination - R. Lee

1 supply-path optimization is?

2 A So SPO refers to, I guess -- well, sorry. It refers to
3 products introduced oftentimes by DSPs. It allows those
4 DSPs to bypass ad exchanges for certain types of digital
5 advertising and transactions and go straight to a
6 publisher's ad server or publisher.

7 Q And did you find that that supply-path optimization
8 path had the potential to impose a competitive constraint on
9 a hypothetical monopolous?

10 A Not a significant enough one, and this is because many
11 of these products aren't for open-web display. For example,
12 for Magnite and PubMatic, their SPO products focus on video
13 or connected TV, not open-web display.

14 The Trade Desk has a product called Open Path,
15 which is limited in the publishers it works with. I think
16 it's approximately 20. And from sworn deposition testimony,
17 The Trade Desk said that it wasn't meant to be a competitor
18 for exchanges. It's focusing on a limited set of publisher
19 needs.

20 Q Now, this Court has heard a lot about Facebook's ad
21 tech tools. Did you evaluate whether Facebook's ad tech
22 tools impose a competitive constraint on ad exchanges that
23 transact open-web display?

24 A I did evaluate those tools and reached the conclusion
25 that they would not impose a significant enough competitive

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1 constraint on ad exchanges.

2 Q And why is that if they're so large?

3 A Well, again, the Facebook tools for display aren't
4 available to open-web publishers, not since Facebook exited
5 the advertiser ad network market with its FAN product in
6 2020.

7 Q And what about Amazon? Did you evaluate whether Amazon
8 ad tech tools would impose a competitive constraint on a
9 hypothetical monopolous in the market or ad exchanges for
10 open-web display?

11 A So Amazon does offer some tools that are primarily for
12 its owned-and-operated properties, again, not available to
13 open-web publishers. They do also offer a DSP, which is not
14 a competitor to ad exchange. They're oftentimes used in
15 conjunction with one another. Similarly, for Amazon's
16 header bidding products, they are not substitutes for ad
17 exchanges. They're, again, used in conjunction with ad
18 exchanges. What I mean they're not substitutes, they're not
19 close enough substitutes to constrain a hypothetical
20 monopolous of ad exchanges.

21 Q So you mentioned Amazon's header wrapper, and I think
22 there's been discussion of other header wrapping tools
23 provided by third parties. Could publishers just switch to
24 header wrapping tools and not use exchanges for open-web
25 display?

Direct Examination - R. Lee

1 A So by and large, again, header bidding tools are a
2 software code that allows publishers to run real-time
3 bidding auctions among multiple exchanges, right. Exchanges
4 are using alongside or within these header wrapper tools.

5 Q So what does that tell you about whether they would
6 constitute a sufficient competitive constraint to restrain a
7 hypothetical monopolous?

8 A Again, they are not close substitutes for one another,
9 so it wouldn't constrain a hypothetical monopolous of ad
10 exchanges.

11 Q Now, let's talk about industry recognition of ad
12 exchanges. What evidence did you review, if any, about
13 whether ad exchanges are viewed by industry participants as
14 a distinct product?

15 A So similar to publisher ad servers, I have seen many
16 industry documents setting aside ad exchanges as a separate
17 set of products. Also, I have seen Google analyses that
18 examine the effects of program changes on other ad exchanges
19 or other 3PEs or third-party exchanges or SSPs.

20 Q All right. I want to talk now about direct evidence of
21 market power in the ad exchange market. Did you evaluate
22 any direct evidence of AdX's market power?

23 A I did.

24 Q And what did you conclude in that regard?

25 A So AdX has charged on average -- or maintained an

Direct Examination - R. Lee

1 approximately 20 percent take rate for at least a decade at
2 this point. I've seen evidence that in limited
3 circumstances, when it faced greater competition, Google was
4 willing to reduce the fee on AdX in some cases to 15 percent
5 in very limited circumstances. It also considered fees as
6 low as 10 percent or less. So that indicates that the
7 20 percent is above-competitive levels. I've also seen
8 evidence that customers of AdX have very limited price
9 responsiveness to its fees.

10 Q And what do you mean by that?

11 A That AdX has the ability to maintain fees
12 above-competitive levels because customers wouldn't be
13 willing to substitute away to alternatives in a sufficient
14 manner to constrain the exercise in market power.

15 Q So I'd like to show you a document that was marked for
16 identification as PTX 188. I believe this was relied on in
17 your report.

18 THE COURT: Is there any objection to 188?

19 MR. ISAACSON: No objection.

20 THE COURT: All right. It's in.

21 BY MS. WOOD

22 Q And do you recognize PTX 188?

23 A I do.

24 Q And what is it?

25 A It's a Google document from 2014 examining pricing for

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1 its ad tech products.

2 Q So let's turn to the page ending in Bates stamp 979.

3 That's PDF page 20, I believe.

4 And what does this page show as you understand it?

5 A So as I understand this, this page examines the price
6 responsiveness of different sets of AdX customers, and it
7 shows that for many of its customers -- or most of its
8 customers by revenue, they exhibited very limited price
9 responsiveness.

10 So what this page is showing is four different
11 groupings of publishers. The top three boxes represent the
12 large publishers, and the bottom are the smaller publishers
13 representing here 43 percent of revenue for the small ones.

14 Q So the numbers in the internal box inside the box, what
15 do those represent?

16 A It's a percent of AdX's gross revenues.

17 Q Okay. So 43 percent of AdX's gross revenue would be
18 attributed to OPG pubs?

19 A That's what this page show.

20 Q Okay. And 27 percent to LPS pubs, for example?

21 A Well, the LPS with less than 20 percent volume on AdX.

22 Q Understood. Okay.

23 A So on the slide, it reports the elasticity. Now,
24 elasticity is an economic concept, one that I teach my
25 students. And it represents the percent change in quantity

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1 for a percent change in price. So an elasticity of, let's
2 say, 2 says for a 1 percent change in price, quantity would
3 change by 2 percent. Now, an elasticity of one or less than
4 one is known as inelastic demand, and that's a strong
5 indicator of possessing significant market power. Because
6 when a firm faces inelastic demand, it can raise prices,
7 increase revenue, and generate profit.

8 And what one sees from this chart is Google is
9 reporting that for the bottom three groups of publishers
10 representing over 70 percent of AdX's gross revenue, their
11 elasticity or expected elasticity is one or less. And for
12 the smallest publishers, the OPG ones, it's report
13 elasticity of approximately zero; that is, these publishers
14 aren't price responsive. They wouldn't substitute away for
15 an increase in price. And that to me, again, is a strong
16 indicator that AdX possesses substantial market power.

17 Q And what is the total blended number at the bottom of
18 the expected elasticity column show?

19 A It shows that across all of these publishers
20 weighted -- demand is inelastic or elasticity is less than
21 one.

22 Q And what does that tell you about Google's market
23 power, if anything?

24 A Again, as I mentioned, this slide indicates that AdX
25 possesses significant market power over its customers.

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1 Q So based on all the evidence that you examined, what
2 did you conclude about whether ad exchanges that serve
3 open-web display ads are a relevant product market?

4 A So this, as well as the other evidence I examined,
5 indicates that to me the HMT would pass for ad exchanges and
6 ad exchanges is a relative and appropriate antitrust product
7 market.

8 Q So let's talk now about Google's market power in the ad
9 exchange market. Did you examine other evidence indicating
10 whether AdX is differentiated from other ad exchanges?

11 A I did. I performed quantitative analyses to examine
12 the extent to which AdX faces competition on the auctions
13 that it wins and the impact that AdX would have if
14 publishers didn't have access to AdX bidding into their
15 auctions.

16 Q So let me show you what we've marked for identification
17 as PTX 1393.

18 THE COURT: Any objection to 1393?

19 MS. WOOD: This is a figure from Professor Lee's
20 report, his rebuttal report.

21 MR. ISAACSON: No objection.

22 THE COURT: All right. It's in.

23 MS. WOOD: And again, Your Honor, we'll do both
24 the sealed version of 1393 and a redacted version.

25 THE COURT: All right. 1393A will be the one

Direct Examination - R. Lee

1 that's on the public site.

2 BY MS. WOOD

3 Q Now, can you describe to us, Professor Lee, what is
4 being presented in this figure in your report?

5 A So what this figure is based on is something known as
6 the GAM log-level data. It's basically all the auctions run
7 in a particular day in June -- this is June 28, 2023 --
8 through Google's ad manager or DFP. And it's approximately
9 20 billion auctions on this day.

10 And on this figure, the height of the bar
11 represents a number of auctions won by Google's AdX on the
12 left and other exchanges identified in the data. And you
13 can see that by the height of the AdX bar, it wins about
14 half of all the auctions that day. And each of the other
15 exchanges win far less than that.

16 Now, what this bar also shows is how many of the
17 auctions that each exchange wins where it faces competition.
18 And by competition, I mean when an exchange wins, is there
19 another bidder that clears the price floor for that auction?
20 And we can see by the size of the green is that for over
21 60 percent or almost two thirds of the auctions that AdX
22 wins, it faces no competition. There isn't another bidder
23 above the floor. In contrast, for all of the other
24 exchanges, they face competition on 70 percent or more of
25 the impressions they win.

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1 Q So if you look at the first firm, LL, do you see
2 there's blue and then a tiny sliver of green?

3 A That's right.

4 Q And what does that show?

5 A So that shows, again, that most of Firm LL's auctions
6 won are facing competition with some other bidder that
7 clears the floor. So this to me is an indication that AdX
8 is significant differentiated even from other exchanges in
9 this product market.

10 Q So what conclusions do you draw from this analysis?

11 A As I mentioned, it's differentiated, that there's many
12 auctions that AdX wins where there isn't, again, another
13 bidder above the floor, and publishers aren't able to
14 replace that with that -- those auction -- the revenue from
15 AdX necessarily with any of these other exchanges. And I
16 think the next analysis speaks to this as well.

17 MS. WOOD: Let's look at PTX 1395, which is Figure
18 28 from Professor Lee's rebuttal report.

19 THE COURT: Any objection?

20 And we'll have the same issue with the A version
21 as well?

22 MS. WOOD: Yes, Your Honor.

23 MR. ISAACSON: No objection.

24 THE COURT: All right. It's in.

25

Direct Examination - R. Lee

1 BY MS. WOOD

2 Q Can you describe, Professor Lee? What does PTX 1395A
3 show.

4 A So this figure reports results from a series of auction
5 simulations. So I'm using the same dataset, the same 20
6 billion auction s or so -- more than 20 billion auctions
7 from June. And what I do is for each of the exchanges
8 across all the auctions, I just remove them one at a time.
9 So the left bar says, if I take AdX out, I remove its bid
10 from all the auctions and hold all the bids from the other
11 exchanges fixed and reallocate the winner to the next
12 highest bid if AdX won -- now, if AdX is removed and it
13 didn't win, it doesn't change what happens.

14 And I do that for each of the exchanges here, and
15 I calculate what is the percent reduction in publisher
16 payouts if each exchange were removed. And so what this
17 shows is publishers' payouts would be reduced by 28 percent
18 on average -- or 28 percent overall if AdX is removed.
19 Whereas any other exchange, the reduction is 1 percent or
20 less. This is a 50 times difference between AdX and the
21 next closet rival.

22 One contributing factor to this difference is what
23 the previous slide showed. Because AdX faces no competition
24 for over 60 percent of the auctions it wins, when it's
25 removed, the auction goes to the floor. And right now it

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1 may not be allocated to anybody. Whereas the other
2 exchanges, when they're removed, because they face
3 competition, some other exchange is there more often than
4 not to pick up that bid. So the publisher's loss in revenue
5 isn't as large. Again, this speaks to AdX's significant
6 differentiation and the reliances publishers have on AdX for
7 generating revenue.

8 Q And what does this analysis say about the uniqueness of
9 demand that can be found via AdX?

10 A So it says, again, the AdX demand has a meaningful
11 effect on publisher payouts, and it's not easily replaceable
12 with an alternative exchange or demand source.

13 Q Now, I want to talk --

14 MS. WOOD: You can put that down. Thank you.

15 BY MS. WOOD

16 Q I want to talk about the barriers to entry to the ad
17 exchange market. Can you describe those?

18 A So for the ad exchange market, there are costs
19 associated with building a new ad exchange. There are costs
20 of overcoming scale effects. I referenced -- or I discussed
21 costs of overcoming indirect network effects and bringing
22 onboard both advertisers and publishers.

23 Another category of barriers to entry comes from
24 Google's conduct, the conditioning of unrestricted access to
25 Google ads to AdX -- it's not provided to rival exchanges --

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1 and actions that DFP has taken to advantage AdX over rivals.
2 Those represent barriers to entry and expansion as well.

3 Q And next I want to talk about what you described
4 earlier as indirect evidence of market power, which is
5 market shares. Did you calculate market shares for AdX?

6 A I did.

7 Q Let's look at PTX 1258.

8 THE COURT: Any objection to 1258?

9 MS. WOOD: Again, that is from Professor Lee's
10 report.

11 MR. ISAACSON: No objection.

12 THE COURT: All right. It's in.

13 BY MS. WOOD

14 Q And what does PTX 1258 show?

15 A So this shows AdX's market shares across various
16 specifications for both impressions and fees over a
17 five-year period. It uses data produced by Google, as well
18 as by third parties or other exchanges.

19 Q And how did you calculate the shares that appear in PTX
20 1258?

21 A So I restricted attention here to indirect open-web
22 display transactions coming through ad exchanges and, again,
23 relied on both data from AdX and from other third-party
24 exchanges. And I will get to this, but one of the
25 specifications also uses data from bidding tools to impute

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1 impressions that might have come from exchanges that did not
2 provide data. And I'll discuss that in a bit.

3 Q So let's look at the two metrics you have for looking
4 at market share. You have an impression's metric and a fees
5 metric. Do you see that?

6 A I do.

7 Q Can you describe the difference between those two
8 metrics?

9 A Sure. So impressions is just a count of transactions
10 that are fulfilled by an exchange. Fees are looking at the
11 share of net revenues that are collected by these exchanges.

12 Q And do you have an opinion as to which metric is more
13 relevant to assess market power?

14 A I think they both can inform market power. Again,
15 remember, market shares are not alone determinative. It's
16 important to look at the totality of the evidence. But
17 impressions speaks to scale effects generated by data. So
18 in that sense, impressions could tell or could speak to
19 scale advantages in data that different exchanges have.

20 Q So let's look at the impressions metric rows, row 1
21 through 4. Can you describe what those show for the years
22 2018 to 2022?

23 A Sure. So I think it's easiest to start with row 4. So
24 row 4 computes market shares among the exchanges that
25 produce data. This is approximate 12 exchanges, and it

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1 shows that in 2022, based on impressions -- this is
2 worldwide by the way -- AdX had a 63 percent share in 2022
3 worldwide.

4 Now, in row 1, what I've done is taken information
5 from the buying tools and try to impute or determine how
6 large are the other exchanges that did not provide data. I
7 can see from these bidding tools where else are they buying
8 impressions from and use that information to perform this
9 exercise.

10 Once I do that, I find that these other exchanges
11 have approximately 10 percent of impressions in 2022, which
12 brings AdX's market share to 56 percent in 2022 once I do
13 that imputation.

14 Now, rows 2 and 3, take that row 1 as the baseline
15 and perform some small exchanges. Row 2 includes these SPO
16 or DSP-to-publisher ad server transactions we discussed.
17 And it shows that even if you were to include these SPO or
18 DSP to PAS transactions, it doesn't change market share by
19 very much.

20 Now, row 3 just excludes Verizon, which exited the
21 SSP market in 2023. So what row 3 is showing the market
22 share among those firms still remaining at present.

23 Q And what do you conclude based on the numbers seen in
24 PTX 1258 about U.S -- I mean worldwide market share for AdX
25 for open-web display?

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1 A So I show -- if you just look at impressions, row 1,
2 AdX has a 56 percent share in 2022. It's maintained at
3 least a 54 percent over this five-year period.

4 Q Now, let's look at PTX 1259, which is the similar
5 chart, Figure 89, from your report but this time for U.S.

6 THE COURT: Any objection?

7 MR. ISAACSON: No objection.

8 THE COURT: All right. It's in.

9 BY MS. WOOD

10 Q And what does PTX 1259 show?

11 A So this table is the same as before. Now it's
12 restricted to impressions generated by U.S. users, but it's
13 the same other restrictions, indirect open-web display
14 transactions through ad exchanges, same sets of
15 specifications, and same market share metrics.

16 Here it shows that among the exchanges that
17 produced data, AdX had a 52 percent share of impressions in
18 2022. And if I do this imputation for other exchanges, AdX
19 had a 47 percent share in 2022 on U.S. impressions.

20 Q Now I want to look -- did you also compare AdX's market
21 share to the market shares of other participants in the ad
22 exchange market?

23 A I did.

24 Q And can we look at PTX 1238?

25 THE COURT: Any objection to 1238?

Direct Examination - R. Lee

1 MS. WOOD: This is from figure 48.

2 MR. ISAACSON: No objection.

3 THE COURT: All right. It's in.

4 MS. WOOD: Again, this will have a redacted
5 version, and the public version will be PTX 1238A.

6 THE COURT: All right.

7 BY MS. WOOD

8 Q Can you tell us what PTX 1238A shows?

9 A So this now takes the 2022 market shares, not just for
10 AdX but for all the other exchanges from which I obtained
11 data. And it plots -- this is specification 1 from the
12 earlier table where I imputed impressions for the exchanges
13 that did not report data. But regardless of whether I do
14 this imputation or not, on worldwide impressions, AdX has
15 nine times worldwide impressions of the next closest rival.

16 Q And what is the significance, if any, of that fact to
17 you, that AdX's market share using this methodology on a
18 worldwide basis is nine times the largest of the next
19 competitor?

20 A I think it's important to examine relative scale
21 advantages as it also informs the extent to which a firm in
22 a market has market power.

23 MS. WOOD: And if we can look at PTX 1261, this is
24 the same information but on a U.S. basis. It also comes
25 from Professor Lee's report.

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1 THE COURT: Any objection?

2 MS. WOOD: 1261.

3 MR. ISAACSON: No objection.

4 THE COURT: Again, there will have to be a 1261A.

5 MS. WOOD: Yes, Your Honor.

6 THE COURT: All right. They're in.

7 BY MS. WOOD

8 Q And can you just for the record identify what is
9 depicted in 1261A?

10 A So this does the same exercise as the previous slide
11 but now using the U.S. user impressions. And here it shows
12 that AdX has a five times greater number of impressions than
13 the next closest ad exchange in the data.

14 MS. WOOD: All right. And let's look at PTX 1292,
15 which is Figure 122 from Professor Lee's report.

16 THE COURT: Again, is there any objection to this
17 one?

18 MR. ISAACSON: No objection.

19 MS. WOOD: And this will have an A as well, Your
20 Honor.

21 THE COURT: It's in.

22 BY MS. WOOD

23 Q What does 1292 show?

24 A So 1292 is now plotting on a monthly basis from the
25 beginning of 2018 to the end of 2022. Market share is based

Direct Examination - R. Lee

1 on impressions for worldwide indirect open-web display
2 transactions through ad exchanges.

3 Q And what is the purpose of depicting the information in
4 this format on a monthly basis?

5 A So one thing this shows is AdX's relative size
6 advantage over its closest rivals has persisted over this
7 period of time. So AdX is that blue line up top with all
8 the other exchanges at the bottom where the light gray line
9 represents the set of all other imputed exchanges. But you
10 can see that AdX here has maintained, again, this relative
11 size advantage over this five-year period.

12 MS. WOOD: And if we could look at PTX 1294, that
13 is figure 124 from Professor Lee's report.

14 THE COURT: I am going to assume the same pattern
15 here. This is for the U.S.

16 MS. WOOD: Yes, Your Honor.

17 THE COURT: Any objection to 1294?

18 MR. ISAACSON: No objection.

19 THE COURT: With an A.

20 MS. WOOD: With an A, yes, Your Honor.

21 THE COURT: It's in.

22 BY MS. WOOD

23 Q What does 1294 show?

24 A As Your Honor has noted, this is for the U.S. noting
25 that the relative size advantage for AdX over its next

Direct Examination - R. Lee

1 closest rivals has also persisted over this time period.

2 Q I want to show you PTX 1242.

3 MS. WOOD: This is from figure 55 from Professor
4 Lee's report.

5 THE COURT: Any objection to this?

6 MR. ISAACSON: No objection.

7 THE COURT: It's in.

8 BY MS. WOOD

9 Q What does PTX 1242 show?

10 A So this figure uses worldwide open-web display
11 transactions through ad exchanges computes an average take
12 rate for AdX in the blue line and the weighted average for
13 other exchanges in green.

14 Q And what is on the right-hand vertical line?

15 A So the right-hand vertical line, it says AdX share, and
16 that corresponds to the shaded gray area in the background.
17 That's just reporting AdX's worldwide share of indirect
18 open-web display impressions in the exchange market
19 underlaid behind the average take rates.

20 Q And what does this figure show with respect to the blue
21 and the green lines?

22 A So the figure shows that over this time period, AdX's
23 take rate has remained relatively stable at 20 percent.
24 Whereas the weighted average of other third-party exchanges
25 was below the blue line.

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1 Q Now, this indicates some of the gray area is not
2 consistent over time or always upwards sloping over time; is
3 that right?

4 A That's right.

5 Q Does declining market share indicate that a firm does
6 not have substantial and sustained market power?

7 A No. And this is because, again, market powers aren't
8 the complete story. To make a determination of market
9 power, it's important to look at the totality of evidence.
10 It includes relative scale advantages, differentiation,
11 direct evidence of market power.

12 Q And ultimately, with respect to market definition and
13 market power, what did you conclude with respect to the ad
14 exchange product market?

15 A So I concluded the ad exchange product market is a
16 well-defined, appropriate, relevant antitrust product
17 market.

18 Q And what did you conclude with respect to AdX's market
19 power in that market?

20 A That AdX possesses substantial and sustained market
21 power protected by significant barriers of entry.

22 MS. WOOD: Is now a good time for a break?

23 THE COURT: You timed yourself perfectly.

24 So we will go to the third market when we get back
25 from the break.

Direct Examination - R. Lee

1 We'll be back at 4:30.

2 (Brief recess taken.)

3 MS. WOOD: May I proceed?

4 THE COURT: Yes, ma'am.

5 BY MS. WOOD

6 Q Let's turn now to the last product market, advertiser
7 ad networks. What are the prominent features of an
8 advertiser ad network based on your review of the evidence?

9 A So there are two important features:

10 First, advertiser ad networks provide a simplified
11 user interface that is useful to smaller advertisers with
12 less complex advertising needs.

13 Second, advertiser ad networks provide the ability
14 to pay on a CPC or cost-per-click basis.

15 Q And what is Google's advertiser ad network product
16 called?

17 A Google Ads.

18 Q And how, if at all, does Google's search engine or
19 search business relate to Google Ads?

20 A So a key part of Google Ads' market power comes from
21 the search advertisers used its product and are then
22 available for purchasing display advertising.

23 Q And what, if anything, is significant about Google's
24 search advertisers?

25 A It's a large number of advertisers ranging from small

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1 to large businesses that, again, are available to purchase
2 display advertising through Google Ads.

3 Q I want to talk now about the competitive constraints on
4 the advertiser ad network market for open-web display. What
5 alternative products did you consider might serve as
6 competitive constraints?

7 A So I examined, as with the other product markets, other
8 forms of digital advertising, including social ads sold
9 through walled gardens. I also examined other types of
10 advertiser buying tools known as DSPs or demand-side
11 platforms.

12 Q So the Court has heard about DSP's. What is Google's
13 DSP called?

14 A DV360, also previously referred to as DV3 or DBM.

15 Q And did you reach a conclusion as to whether
16 demand-side platforms, DSPs, are a competitive constraint on
17 advertiser ad networks since they're both buying tools?

18 A So my conclusion -- I concluded that DSPs are not a
19 significant enough competitive constraint on a hypothetical
20 monopolous of advertiser ad networks to prevent it from
21 exercising significant market power.

22 Q So I'd like to show you what's been marked for
23 identification as PTX 1231, which is a figure from your
24 report.

25 THE COURT: Any objection?

Direct Examination - R. Lee

1 MR. ISAACSON: No objection.

2 THE COURT: All right. It's in.

3 BY MS. WOOD

4 Q And what does PTX 1231 show, Professor Lee?

5 A So this uses data from Google that allows me to use
6 advertiser usage of both ads at DV360. So this figure plots
7 the total number of distinct advertisers identified in this
8 data who use only Google Ads, only DV360, or both Google Ads
9 and DV360 in 2022.

10 Q And what data did you use to prepare figure 35?

11 A Again, this is data from Google that looked across both
12 of these buy-side products, Google Ads and DV360.

13 Q And was that the Google log level data?

14 A No. This is a different dataset.

15 Q Okay. You have source Google XP data DOJ RFP 7. Is
16 that the data that you relied upon?

17 A Yes, for this figure.

18 Q And what does it show with respect to the number of
19 advertisers who use only Google Ads?

20 A So there are a far greater number of advertisers who
21 among the set who used Google's buying products only used
22 Google Ads and not DV360.

23 Q Okay. And if we can also turn to PTX 1232.

24 THE COURT: Any objection to 1232?

25 MR. ISAACSON: No objection.

Direct Examination - R. Lee

1 THE COURT: All right. It's in.

2 BY MS. WOOD

3 Q And can you tell us -- is PTX 1322 based on the same
4 data?

5 A It is.

6 Q What does it show?

7 A I now plots total spending for these advertisers who
8 use either of Google Ads or DV360. And for the advertisers
9 who only use Google Ads, they spend about the same amount --
10 a little bit less than those advertisers who use both Google
11 Ads and DV360. Now, I recall that there were a far greater
12 number of advertisers who only use Google Ads. So that
13 means on average, these advertisers who use Google Ads are
14 smaller than the advertisers who use both tools. Even so,
15 the total spending from these smaller advertisers is
16 significant.

17 Also, it's worth noting that for those advertisers
18 who use both Google Ads and DV360, there's a large amount of
19 their spending on Google Ads as well. And this is indicated
20 by the area in blue on the right most column.

21 Q And what does that tell you about Google Ads and its
22 demand?

23 A So it tells me, one, there's a lot of demand that comes
24 through Google -- or a lot of transaction volume through
25 Google Ads even though these advertisers are smaller on

Direct Examination - R. Lee

1 average. But another thing I draw from this figure is that
2 the types of customers that DV360 and Google Ads cater to
3 are different. Even though there's some overlap, they have
4 different attributes.

5 Q Now, let's look at PTX 1235, another figure from your
6 report.

7 THE COURT: Any objection?

8 MR. ISAACSON: No objection.

9 THE COURT: All right. It's in.

10 BY MS. WOOD

11 Q And was PTX 1235 also based on the same data produced
12 by Google?

13 A It was.

14 Q And what does it show?

15 A So now I'm going to be looking at only the advertisers
16 who are identified as using Google Ads, and I'm going to
17 break these advertisers into five groups based on their
18 total spending.

19 On the way left are the top hundred advertisers
20 going to smaller and smaller and smaller advertisers being
21 moved to the right. Now, the vertical axis reports the
22 percent of these groups of advertisers who only use Google
23 Ads versus also using DV360.

24 Q And I'll tell you: It's a little hard to read the key.
25 Is the Google Ads only blue or black?

Direct Examination - R. Lee

1 A The Google Ads only is blue. So if one begins with the
2 right most column -- these are the advertisers outside the
3 top hundred thousand -- you can see that pretty much
4 essentially all of them are only using Google Ads. That's
5 because the bar is almost completely blue.

6 But as you go to the left, you start looking at
7 larger and larger advertisers and you see the fraction of
8 them that also are using DV360 increases, again, consistent
9 with the pattern that larger advertisers are the ones who
10 are more likely to use DSPs, like DV360.

11 Q And what, if anything, does this PTX 1235 lead you to
12 conclude?

13 A Well, it's additional that DSPs and advertiser ad
14 networks cater to different needs and different sets of
15 customers even though there might be some customers who use
16 both tools.

17 Q So I'd like to show you next PTX 1385.

18 THE COURT: Any objection to 1385?

19 MS. WOOD: This is also a figure from his report.

20 MR. ISAACSON: No objection.

21 THE COURT: All right. It's in.

22 BY MS. WOOD

23 Q And in 1385 the colors are very hard to see, we have
24 prepared Plaintiffs' Demonstrative S where we tweaked the
25 colors to make it a little more legible. Plaintiffs'

Direct Examination - R. Lee

1 Demonstrative S is what's up on the screen now. Do you see
2 that?

3 A Yes.

4 Q Okay. So looking at this demonstrative, are all the
5 figures and the data the same in Plaintiffs' Demonstrative S
6 as in PTX 1385?

7 A Yes.

8 Q Okay. And the only thing that's been changed is the
9 colors for readability?

10 A Yes.

11 Q Okay. Now, can you describe what this figure shows
12 starting with the legend on the top, CPM, CPC to CPM, CPA to
13 CPM, CM -- CPM_{AV} to CPM?

14 A Again, apologize for the additional acronyms.

15 I think for the purposes of this chart, it might
16 be more effective just to focus on the first two boxes.
17 This is the blue and the orange. So the blue represents CPM
18 transactions, cost per mille or cost per thousand
19 impressions. The orange is written as CPC to CPM, and what
20 this means is advertisers pay on a cost-per-click basis.
21 But publishers are paid out on a cost per mille or cost per
22 thousand impression basis.

23 Q What's the significance of that, that advertisers pay
24 cost per click but publishers receive CPM?

25 A So CPC and CPM are different ways of paying for ads,

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1 and there's evidence that discusses why different types of
2 bidding are more appropriate for different kinds of
3 advertising objectives. For example, CPC bidding when you
4 pay per click is suitable for when you're trying to drive
5 conversions. Let's say a click through to a website.
6 Advertisers might care about that. Whereas bidding on an
7 impression basis can be useful for, let's say, driving brand
8 awareness, when you're just trying to show an ad.

9 Q And what does Plaintiffs' Demonstrative S, as in Sam,
10 and PTX 1385 show you with respect to Google Ads in
11 particular?

12 A Sure. So all of the bars with the exception of Google
13 Ads are DSPs. DV360 is Google's DSP. And what you'll see
14 for all the DSPs, except for DV360, it's all CPM. DV360 has
15 a little bit of transactions that are paid out on a CPC
16 basis. And this is using data from 2018 to 2022. In
17 contrast, Google Ads -- I think it's approximately
18 80 percent are in a CPC payment basis on the part of
19 advertisers. So this is evidence that Google Ads is
20 differentiated from these other DSPs in the manner that
21 advertisers pay for advertising.

22 Q Now, you can put that aside.

23 Did you consider whether buying tools offered by
24 Facebook are competitive constraints for advertiser ad
25 networks that transact open-web display ads?

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1 A I did examine this. So Facebook's Audience Network or
2 FAN was part of the advertiser ad network for open-web
3 display until its exit from open-web display in 2020. And
4 that's why it's included in the market share calculations
5 we'll come to.

6 But at present, it's not available as a source of
7 demand for open-web publishers. They can't sell their
8 impressions to Facebook for open-web display. And for the
9 reasons I discussed earlier whereby walled gardens restrict
10 advertisers to basically walled garden's properties.
11 Whereas Google Ads and other advertising reach a wider range
12 of websites, can target users at different points in times
13 across these sites, those are reasons why Facebook's tools
14 are not competitive constraints or significant enough to
15 constrain the exercise of market power by a hypothetical
16 monopolous of advertiser ad networks.

17 Q So I want to talk now about direct evidence of market
18 power in the advertiser ad network market for open-web
19 display. Did you examine direct evidence that Google Ads
20 has market power in that market?

21 A Yes, I did.

22 Q Let me show you what's marked for identification as PTX
23 1808. This is from your report.

24 THE COURT: Any objection to 1808?

25

Direct Examination - R. Lee

1 BY MS. WOOD

2 Q I'm sorry. It is not from your report. It is cited in
3 your report.

4 MR. ISAACSON: The objection is only to -- this is
5 one with a lot of notes.

6 THE COURT: All right.

7 MR. ISAACSON: So if we submit the copy without
8 the notes --

9 THE COURT: All right. The copy without the
10 notes, 1808, is in.

11 MS. WOOD: Without the comments, yes, Your Honor.

12 BY MS. WOOD

13 Q And what is PTX 1808?

14 A This is a Google document describing an experiment, the
15 value and the impact of increasing GDN or Google Ads' fee
16 when bidding on AdX.

17 Q And was this an experiment that Google itself ran
18 internally?

19 A That's my understanding, yes.

20 Q Okay. And if you can turn to page 2 -- sorry, at
21 page 1, do you see under RASTA for AdWords on AdX slice? Do
22 you see that?

23 A Yes.

24 Q And what is this talking about? If you could, explain
25 that chart for us.

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1 A Sure. This experience being described is increasing
2 the Google Ads take rate or margin on AdX from 14 percent to
3 15 percent. That represents a 7 percent price increase.
4 It's essentially -- you can think of it as a real-world HMT
5 run just on Google Ads at its prevailing price at the time.
6 What this click shows is that it's predicted to increase
7 Google Ads' and Google's profit -- in other words, a
8 significant price increase would be profitable. It also
9 notes that publisher payouts would fall from this change,
10 and there would be a slight reductions in the number of
11 impressions transacted.

12 Q And what do those facts tell you about the market power
13 of Google Ads and the advertiser ad network market?

14 A Well, it indicates that Google with Google Ads has
15 significant market powers able to profitably implement a
16 significant price increase above what are at the time
17 current levels.

18 Q What would you expect to happen in a competitive market
19 if market a participant increased its price by 7 percent?

20 A Well, in a more competitive market, one would expect
21 such a price increase of 7 percent to lead to a greater
22 reduction in impressions. Right here it shows a 7 percent
23 increase in price is only predicted to have a quarter of a
24 percentage point reduction in the number of impressions
25 transacted.

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1 Q All right. I'd like to look at another experiment you
2 examined in connection with Google Ads. If we can, look at
3 PTX 858.

4 MS. WOOD: This is already in evidence, Your
5 Honor.

6 THE COURT: Okay.

7 BY MS. WOOD

8 Q Is this one of the documents that Google produced that
9 you relied on in connection with your report?

10 A It is.

11 Q And what does it show?

12 A So this examines some years later, in 2018, also
13 changing Google Ads' margins on AdX web publishers. So it
14 says here in the first paragraph it's focusing on AdX web
15 publishers and not on app publishers. So it demonstrates
16 the ability to target different prices for web versus app
17 impression. And it varies, the margin that AdX charges on
18 AdX, from 10 percent to 25 percent via a series of
19 simulations and experiments.

20 Q So let's look at the next page ending in Bates stamp
21 247, PDF page 2. What does this diagram and chart show?

22 A So on the right, it plots the -- on the vertical axis,
23 the percent changed and its profit from on the horizontal
24 axis varying Google Ads' margin on AdX from 10 percent
25 upwards 12.5, 15, and so on up to 25 percent. It shows that

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1 as Google Ads increases its margin from 50 percent upwards,
2 it actually increases its profit. So for -- on the left, it
3 shows the revenue change. But for every dollar of loss in
4 revenue, it makes up for it more and profits actually
5 increase.

6 Q What does that tell you as an economist?

7 A So, again, this is evidence that AdX possesses
8 significant market power, the ability to increase prices and
9 do so profitably.

10 Q Now, what do these two different experiments that
11 Google itself ran tell you about competition in the
12 advertiser ad network market?

13 A So it's helpful with these two analyses. It indicates
14 that substitution to all alternatives other forms of digital
15 advertising to DSPs and so on aren't sufficient to constrain
16 this exercise of market power, that Google Ads is predicted
17 here in these experiments to still be able to increase
18 profits by increasing its fees.

19 Q So I want to talk now about --

20 MS. WOOD: We can put that down.

21 BY MS. WOOD

22 Q -- about quality. As you as an economist, what do you
23 mean by quality when you are looking at customer products?

24 A So as a general matter, quality can refer to -- or
25 refers to rather non-price attributes of a product that

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1 customers value. In the case of ad tech products, from
2 publishers' perspective, evidence indicates the most
3 important quality attribute is how well that product
4 monetizes or generates yield; how well it, again, provides
5 revenue to a publisher when selling impressions. And
6 oftentimes that's driven by the advertising demand that that
7 ad tech product can source.

8 From the advertiser's perspective, an important
9 attribute of quality is the publisher inventory that's
10 available to the advertiser to bid upon.

11 Q And what did you find with respect to the quality of
12 Google Ads with respect to advertisers?

13 A So with Google Ads, I think in terms of quality,
14 there's evidence that increasing Google Ads' inventory to
15 advertisers would actually increase advertiser ROI. There's
16 a Google document when evaluating opening up Google Ads to
17 other exchanges or bidding on more inventory, that doing so
18 would increase advertiser ROI.

19 And so that's consistent with it restricting
20 access to other exchanges, it's actually degrading the
21 quality or failing to maintain quality at competitive levels
22 consistent with the possession and exercise of significant
23 market power as well.

24 Q And ultimately, what did you conclude about the
25 relevance of an advertiser ad network market for open-web

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1 display?

2 A I concluded that such a market would pass the HMT and
3 is an appropriate, relevant antitrust product market.

4 Q So we've already talked about some of the direct
5 evidence of Google Ads' market power. You discussed that
6 before.

7 Let's talk about differentiation. Did you look at
8 ways in which Google Ads was able to differentiate itself
9 from other rivals?

10 A I did.

11 Q And if we can pull up PTX 1444 --

12 THE COURT: Any objection to 1444?

13 MS. WOOD: This is also from Professor Lee's
14 report.

15 MR. ISAACSON: No objection.

16 THE COURT: Again, this is in with a requirement
17 for redaction.

18 MS. WOOD: Yes, Your Honor. 1444A will be the
19 redacted version.

20 BY MS. WOOD

21 Q Professor Lee, what did you do to prepare this exhibit?

22 A Sp this exhibit is actually a similar auction simulate
23 as the one I described before with AdX. It uses the same
24 GAM log-level data. This is over 20 billion auctions run in
25 June of 2023 in a single day.

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1 Now, what it does is it actually removes, instead
2 of just exchanges -- there are still some exchanges in the
3 firms. That's how the data is identified. But it also
4 removes where possible individual bidding tools or buying
5 tool. So you see Google Ads on the way left. You see
6 DC360. There are DSPs and other buying tools that are
7 identified.

8 Now, among the set of auctions, Google Ads won
9 approximately 28 percent of them, and on the auctions that
10 it won, it faced competition on approximately half of it.
11 Now, it shows that Google Ads, if it's removed, it would
12 reduce publisher payouts holding all the other bids fixed by
13 14 percent. And this is much larger than any other
14 non-Google bidding tool or non-Google exchange. It would
15 also be predicted to reduce the number of impressions won by
16 AdX by 40 percent.

17 So this is consistent not only with Google Ads
18 being differentiated from other buying tools in the
19 nature -- or how much demand it can bring and the impact on
20 publisher payouts, but it's also consistent with Google Ads
21 not bidding into other exchanges as harming those other
22 exchanges' ability to deliver yield for publishers.

23 Q Now, why did you consider non-advertiser ad networks in
24 PTX 1444A?

25 A Well, I just -- again, in the data, it identified other

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1 buying tools. It identified other exchanges. This goes to
2 show that even if one were to conclude other sources of
3 demand, Google Ads is significantly differentiated. It has
4 a much bigger impact on publisher payouts than these other
5 sources.

6 Q And is that a way to look at competitive constraints in
7 the advertiser ad network market?

8 A It informs, and it's a reason why Google Ads possesses
9 market power. It's the impact on publisher payouts.

10 Q Now, did you conduct any other analysis on the value of
11 Google Ads to publishers of open-web display?

12 A I did.

13 Q So if we can, look at Plaintiffs' Demonstrative P, as
14 in Peter.

15 What is Plaintiffs' Demonstrative P., as in Peter,
16 based on?

17 A So this is based on a set of analyses I conducted in my
18 report. This uses also the log-level data, so 20 billion in
19 auctions in a single day in June of 2023.

20 And let's focus on the left pie chart first. What
21 the left pie chart shows is -- actually, let me reset for a
22 moment.

23 So among these 20 billion auctions, there are
24 255 million unique advertiser publisher pairs, that is, all
25 the different sets of advertisers who are buying impressions

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1 from different publishers. Some of these advertisers and
2 publishers interact multiple times in that day.

3 Now, what the left shows is among all those pairs
4 of advertisers and publishers, 58 percent of those pairs
5 only interacted through Google Ads that day. Now, in this
6 dataset, only one particular tool is identified per
7 transaction. So Google Ads is identified as a transaction
8 for that advertiser publisher pair. There's another
9 15 percent of these pairs that exclusively transact through
10 DV360. Now, what the right pie chart does, it examines what
11 fraction of revenues are represented by these different
12 advertiser publisher pairs.

13 Focusing on the dark blue slice of the right pie
14 chart, it shows that among the pairs that transact that day
15 only through Google Ads, that's 20 [sic] percent of
16 publisher revenues in the data.

17 Q You said 20 percent or 27 percent?

18 A 27 percent.

19 Q And what is the significance of that to you as an
20 economist?

21 A Well, to me that's -- a significant share of the
22 revenue from all of these auctions are between advertisers
23 and publishers who are only going through Google Ads that
24 day. It speaks to one way of quantifying the sense in which
25 Google Ads demand is unique or differentiated. I just

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1 wanted to note on the right, another 37 percent of revenues
2 is represented by advertisers and publishers who interact
3 through Google Ads in some other channel. But there's only
4 .3 percent that transact through another firm, and another
5 2.3 percent of revenues that transact exclusively through
6 some other buyer in AdX. These are big differences between
7 the 27 percent and 2.3 percent or .3 percent. Again,
8 speaking to the differentiated nature of Google Ads.

9 MS. WOOD: And, Your Honor, I will just note that
10 there has been a confidentiality redaction on Plaintiffs'
11 Demonstrative P. So we will put Plaintiffs' Demonstrative
12 PA on the website, but you have Plaintiffs' Demonstrative P
13 in your binder.

14 THE COURT: Thank you.

15 BY MS. WOOD

16 Q Taken together, Professor Lee, what do these
17 quantitative analyses tell you about Google Ads?

18 A It informs to the extent, again, to which Google Ads is
19 significantly differentiated from other advertiser ad
20 networks, as well as from other sources of demand that
21 publishers can access.

22 Q Now, what is the relationship between unique demand and
23 substantial and sustained market power?

24 A Well, I think the extent to which unique demand matters
25 for substantial and sustained market power is the extent to

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1 which that demand here affects publisher payouts and to the
2 extent it's replaceable with alternatives, the extent to
3 which a publisher can move to a different demand source to
4 replace lost revenue informs the extent to which a tool has
5 market power.

6 Q So is it your opinion that any ad tech firm has unique
7 demand necessarily has substantial and sustained market
8 power?

9 A No. As I alluded to just before, what's important is
10 the extent to which it affects publisher revenues and the
11 extent to which it's replaceable with other alternatives.

12 Q Now, let's talk about barriers to entry or expansion.
13 Do any barriers or entry or -- do barriers to entry or
14 expansion exist in the advertiser ad network market for
15 open-web display?

16 A Yes. This includes the costs, again, of building or
17 launching an ad exchange, obtaining the necessary data and
18 scale -- and overcoming scale and network effects to expand
19 on advertiser ad network. It also include cost of
20 overcoming factors related to Google's conduct in accessing
21 inventory for a new advertiser ad network.

22 Q And did you see any examples of barriers to entry and
23 expansion in the evidence you reviewed in this case with
24 respect to advertiser ad networks?

25 A So I think there's evidence that some of these barriers

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1 contributed to or were a factor in Facebook's exit of the
2 advertiser ad network for open-web display.

3 Q Now, let's turn now to indirect evidence of market
4 power. Did you calculate Google's market share in the
5 advertiser ad network market?

6 A I did.

7 Q So let's look at PTX 1243.

8 THE COURT: Any objection to 1243?

9 MS. WOOD: And again, this will have an A for the
10 public version.

11 THE COURT: All right.

12 MR. ISAACSON: No objection.

13 THE COURT: All right. It's in.

14 BY MS. WOOD

15 Q What does 1243A show, Professor Lee?

16 A So this figure uses data from Google and from other
17 advertiser ad networks and plots market shares on the
18 vertical axis on a monthly basis from the beginning of 2018
19 to the end of 2022. It's using only indirect open-web
20 display transactions.

21 Q And is that on a worldwide basis?

22 A This is on a worldwide basis.

23 Q Okay. And what does it show you about Google Ads'
24 market share relative to its competitors?

25 A It shows it's much larger than its next closest rivals.

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1 In 2022 on a worldwide basis, Google Ads had an 87 percent
2 share of this market, six times larger than the next closest
3 rival.

4 Q So let's look at its twin counterpart, which we've come
5 to expect. Let's look at PTX 1269, please.

6 MS. WOOD: And that will also have an A for the
7 public version.

8 THE COURT: Any objection?

9 MR. ISAACSON: No objection.

10 THE COURT: All right. It's in.

11 BY MS. WOOD

12 Q What is 1269A?

13 A So this is repeating the same figure now restricting
14 attention to U.S. impressions. Google Ads had an 88 percent
15 share of these impressions in 2022. Again, also six times
16 larger than the next closest competitor. In both worldwide
17 and U.S., Google Ads maintained an 86 percent share annually
18 since 2018.

19 Q All right. So ultimately, did you reach a conclusion
20 with respect to market definition and market power for the
21 advertiser ad network market?

22 A I did.

23 Q What were your conclusions?

24 A That advertiser ad networks for open-web display ads is
25 an appropriate and relevant antitrust product market and

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1 that Google Ads possesses substantial and sustained market
2 power protected by significant barriers to entry.

3 Q So I want to talk briefly about geographic markets.
4 How do you go about evaluating as an economist what is an
5 appropriate geographic market?

6 A So for this I also employed the HMT and examined the
7 extent to which a hypothetical monopolous of a set of
8 products could exercise market power over customers located
9 in any particular region.

10 Q Now, as an economist, can there be more than one
11 geographic market that is relevant for your analysis?

12 A Yes, there can be.

13 I just wanted to note that also for a geographic
14 market, it's important to consider the extent to which it's
15 appropriate for evaluating the competitive effects of the
16 conduct at issue.

17 Q Tell me what you mean by that.

18 A So basically, looking at areas over which competition
19 can be impacted by the conduct, and I'll discuss more when I
20 talk about the patterns --

21 Q Okay.

22 A -- if that's okay.

23 Q So did you reach a conclusion with respect to what you
24 consider relevant geographic markets for these three product
25 markets?

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1 A I did.

2 Q And what did you conclude?

3 A I concluded that both worldwide with some limited
4 exceptions and the United States are both appropriate or
5 relevant geographic markets for all of the product markets.

6 Q What do you mean worldwide with some exceptions?

7 A So the exceptions are excluding China, which
8 substantially restricts Internet access, and also some
9 limited regions that are subject to U.S. sanctions.

10 Q Okay. And did any of your conclusions change with
11 respect to the geographic market for each of the three
12 product markets you examined?

13 A No. My conclusions regarding competitive effects hold
14 for all geographic -- for both geographic markets in all
15 product markets.

16 Q And what evidence did you consider to make a
17 determination about the appropriate, relevant geographic
18 market?

19 A So I considered how customers of the products interact
20 with each other, how suppliers compete with each other, and
21 the scope of Google's conduct that is at issue here.

22 Q So let's look at PTX 904.

23 MS. WOOD: I don't believe there's been an
24 objection lodged to PTX 904.

25 THE COURT: All right. Any objection,

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1 Mr. Isaacson?

2 MR. ISAACSON: No objection.

3 THE COURT: Oh this came in, didn't it, before?

4 MS. WOOD: Okay.

5 THE COURT: Yes, it's in.

6 BY MS. WOOD

7 Q And is this PTX 904 cited in your report?

8 A Yes.

9 Q And what is PTX 904?

10 A It's an internal Google presentation examining the
11 sell-side.

12 MS. WOOD: Oh, I recognize the puppy and Darth
13 Vader. You're absolutely right, Your Honor. It's been a
14 long day.

15 BY MS. WOOD

16 Q Can you turn to the page ending in Bates stamp 553,
17 which is PDF page 19, and you also look at it on the screen,
18 whichever is easier for you.

19 What is being displayed on this page?

20 A So on this page is a map of the world which divides the
21 world into three regions, the Americas; EMEA, which is
22 Europe and Africa; and then APAC or Asian specific region.

23 The arrows show -- we'll basically go from these
24 circles, which is the advertising spend origin where
25 advertisers are located and show where that money goes to

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1 different publishers located around the world. And it shows
2 that indeed customers of these ad tech products interact
3 across country and regional boundaries.

4 The diagram also provides in the lower left sort
5 of numbers indicating how much spend goes from each region
6 to another region. And it shows that almost a third of
7 spending from the Americas goes to customers located
8 elsewhere in the world and almost a third of spending into
9 the Americas comes from advertisers located elsewhere in the
10 world. And so this is consistent with customers, again,
11 interacting worldwide across country boundaries.

12 Q Now, how, if at all, do publishers sell impressions
13 factor into your geographic market analysis?

14 A Can you repeat your question, please?

15 Q Yeah. How do suppliers, meaning publishers -- how does
16 competition in that market -- what does that tell you about
17 a relevant geographic market?

18 A Yeah. So publishers I indicated here that they are
19 selling impressions to customers located worldwide, but
20 also, the suppliers of these products, these ad tech
21 products are located worldwide and sell to customers located
22 worldwide as well.

23 Q So let's look at PTX 657.

24 MS. WOOD: I believe this is subject to our stip
25 if it's not already in evidence.

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1 MR. ISAACSON: We have no objection, Judge.

2 THE COURT: All right. 657 is in.

3 BY MS. WOOD

4 Q If we can, turn to PDF page 29, which is Bates stamp
5 351. This is a 2018 presentation by Google. Can you
6 explain what you understand to be presented on this page?

7 A Yes. So this is a Google page that's tracking what
8 fraction of what they call addressable ad impressions that
9 available to these open-web display products are going
10 through Google's sell-side products. What's notable is they
11 are tracking this fraction on a global excluding China
12 basis. So that's consistent with competition for these
13 products being global as well.

14 Q And I see there's a heading there, Web Display Sizing.
15 What do you understand that to mean?

16 A This is referring to open-web display impressions.

17 Q Okay. Now, let's talk about the geographic market of
18 the United States. Did you also conclude that it would be
19 appropriate to consider the United States as well as a
20 relevant geographic market?

21 A Yes. First, it's -- given evidence that Google is
22 actually able to price discriminate on its products, charge
23 different fees at the customer level or even impression
24 level, a hypothetical monopolous of any of these products
25 could also target price differences to customers located in

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1 a particular geographic region. But for the United States,
2 it's a particular meaningful share of revenues for many of
3 these ad tech players, and it also can be useful to focus
4 attention on customers located in this country.

5 Q Now, is that appropriate, to have two different
6 relevant geographic markets in one antitrust case, from an
7 economist's point of view obviously?

8 A It can be helpful sometimes to look at a broader lens
9 to see the complete scope or effects of Google's conduct but
10 also examine whether those conclusions would hold even if
11 one ordered restrict retention of customers located in only
12 a particular area.

13 Q And based on your work on this case and applying your
14 experience and expertise, do you believe that one geographic
15 market is more useful than the other for assessing Google's
16 market power?

17 A Well, for assessing market power, my conclusions hold
18 for both geographic markets. But in terms of value and the
19 competitive effects of Google's conduct, for the reasons I
20 discussed, that customers interact across country
21 boundaries, supplier competition is global, and the scope of
22 Google's conduct is global as well. It's not restricted to
23 any one country. I think it's more appropriate to look at
24 the competitive effects on a worldwide basis.

25 Q Why is that?

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1 A For the reasons I just described, that, again the
2 conduct crosses country boundaries and affects customers
3 worldwide.

4 Q All right. Let's talk finally about your last opinion,
5 which is about Google's conduct.

6 MS. WOOD: Again, Your Honor, we're not going to
7 repeat with respect to all the anticompetitive conduct in
8 this case but just the specific analysis Professor Lee did
9 with respect to the conduct in this case.

10 BY MS. WOOD

11 Q So what were the five pieces of conduct that you found
12 to be anticompetitive?

13 A So the five pieces of conduct that I evaluated and
14 examined to be anticompetitive relates to the conditioning
15 of unrestricted access to Google Ads to the use of AdX.
16 This is referred to sometimes as near-exclusive relationship
17 between the two products.

18 Second, the conditioning of real-time bids from
19 AdX to -- I'm sorry. The conditioning of access of
20 real-time bids from AdX to DFP.

21 Third, exclusive advantages within DFP provided to
22 AdX. This relates to these first and last look advantages.

23 Fourth, Unified Pricing Rules.

24 And, fifth, the acquisition of Admeld.

25 Q And did you find each of those five pieces of conduct

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1 that you just identified to be anticompetitive?

2 A Yes.

3 Q And did you evaluate pro-competitive justifications in
4 your analysis of Google's conduct?

5 A I did.

6 Q And did your evaluation of the pro-competitive
7 justifications for Google's conduct change your opinion?

8 A No, they did not.

9 Q And why was that? Why did they not change your
10 opinion?

11 A So I evaluated certain pro-competitive justifications
12 put forth by Google's experts. I found that many were not
13 specific to the conduct in question.

14 Q What do you mean by that, many of the pro-competitive
15 justifications were not specific to the conduct in question?

16 A That is, they could have been realized without engaging
17 in the conduct at issue here. They are not necessarily only
18 realizable with that conduct.

19 Q And then I think I interpreted you. So apologies for
20 that.

21 What else did find with respect to your evaluation
22 of pro-competitive justifications?

23 A So I also found that the -- for the justifications that
24 were related to the conduct, they weren't substantiated by
25 what I had seen.

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1 Q Okay. So let's look at the first conduct you
2 identified, unrestricted access to Google Ads to AdX. And
3 if we could, look at PTX 1389.

4 THE COURT: Any objection to 1389?

5 MS. WOOD: This is figure 18 from Professor Lee's
6 report.

7 MR. ISAACSON: No objection.

8 THE COURT: All right. It's in.

9 MS. WOOD: And again, this will have a 1389A for
10 the public version.

11 THE COURT: All right.

12 BY MS. WOOD

13 Q What does PTX 1389 show?

14 A So earlier I discussed why -- or rather, I described
15 Google Ads's market share of the advertiser ad network
16 market. Here, what I'm showing is that even if one were to
17 include other buying tools, including DSPs, Google Ads still
18 has a very large share of all indirect open-web transactions
19 worldwide here through all of these advertiser buying tools
20 with a share of 45 percent and very little of that -- you
21 can see at the top -- is available or made available to
22 third-party exchanges.

23 Q And how does that influence your opinion about the
24 anticompetitive conduct of Google's restricting full access
25 to AdWords or Google Ads to AdX?

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1 A Again, it's another measure of how large Google Ads is
2 as an advertising demand source.

3 Q Okay. And then we looked earlier at PTX 1444, which is
4 already in evidence. So just briefly, if you can, tell us
5 how that relates to Google's anticompetitive conduct.

6 A Yes. So this is the auction simulation I discussed
7 earlier where one removes Google Ads. As I alluded to
8 before, in this auction simulation, if Google Ads wasn't
9 bidding, AdX would be predicted to lose 40 percent of the
10 impressions it had previously won. So this is consistent
11 with other exchanges not having access to Google Ads or all
12 of Google Ads harming their competitiveness and ability to
13 win impressions.

14 Q And can you describe how Google Ads bidding on an ad
15 exchange affects that ad exchange's competitiveness?

16 A So this goes again to quality of an ad exchange by
17 generating yield. An ad exchange runs auctions, and if
18 there's more advertisers bidding into that auction, all is
19 equal that tends to increase the expected price that
20 exchange can provide to a publisher.

21 Q So let me -- let's look at PTX 324, which is already in
22 evidence. And you cite this document in your report,
23 Professor Lee?

24 A Yes.

25 Q And what does PTX 324 show?

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1 A So this is an auction simulation run now using -- well,
2 this is a Google simulation from 2014 running a similar
3 simulation where it examines what happens if GDN or Google
4 Ads didn't participate in AdX auctions. And even in this
5 simulation, it finds that AdX would win far fewer
6 impressions and publisher payouts would be reduced.

7 Q So if we can look on page 2 ending in Bates stamp 609,
8 can you show us what you're referring to there?

9 A So the first row and the last row look side by side
10 at -- in the simulation, the query is when there are GDN
11 bids and then the right without the GDN bids. And it's that
12 difference that indicates the reduction in the queries won
13 by AdX, as well as the reduction in the publisher payout.
14 And it's significant.

15 Q So for this simulation run on January 5, 2014, the
16 daily queries with Google Ads is 7.49 billion. Am I reading
17 that correctly?

18 A Yes.

19 Q And without Google Ads, the daily queries drops down to
20 3.64 billion; is that right?

21 A Yes.

22 Q And what does that show with respect to the daily
23 publisher payout with and without Google Ads?

24 A It reduces, as said in the abstract -- it's a
25 65 percent reduction in publisher payout.

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1 Q So from about \$3.9 million to about \$1.3 million in one
2 day?

3 A Yes.

4 Q And what does that tell you for purposes of assessing
5 the anticompetitive effect of Google's conduct?

6 A Again, it's consistent with my own auction simulation,
7 that the impact of Google Ads bidding into an exchange is as
8 large. And an exchange that doesn't Google Ads bidding into
9 it would be -- it's competitiveness would be adversely
10 impacted.

11 Q Now, have you examined documents that discuss the
12 relationship between Google Ads' and AdX's market power?

13 A Yes, I have. I've seen many Google documents that link
14 Google Ads' relationship with AdX to AdX's ability to
15 support and sustain its 20 percent price or take rate.

16 Q So let's look at PTX 1403.

17 THE COURT: Any objection?

18 MS. WOOD: This is also a figure from Professor
19 Lee's reports.

20 THE COURT: And this --

21 MS. WOOD: And this will have an A version, Your
22 Honor.

23 MR. ISAACSON: No objection.

24 THE COURT: All right. 1403 is in with A.

25

Direct Examination - R. Lee

1 BY MS. WOOD

2 Q Can you describe for the Court what PTX 1403A shows?

3 A Yeah. So on the left, it examines the share of
4 impressions from another advertiser ad network and which
5 exchanges it buys through. And the right, it shows the same
6 statistic for Google Ads. And it shows that on the left,
7 AdX gets 54 percent of those impressions, but the rest go to
8 other firms. Whereas on the right, Google Ads -- 91 percent
9 of its impressions are transacted through AdX.

10 Q And ultimately, what did you conclude from this
11 analysis in PTX 1403A?

12 A So it shows that it's feasible and it does happen that
13 other advertiser ad networks do bid more widely than Google
14 Ads in other exchanges. Also, DSPs, like Xandr and DV360,
15 also bid more widely on Google Ads and other exchanges.

16 Q Now, you can put that document aside.

17 How, if at all, does the presence of AWBid -- the
18 Court has heard a lot about AWBid. How does the presence of
19 AWBid affect your opinions about Google's -- anticompetitive
20 effect of Google's conduct?

21 A So AWBid does not change my opinion that this
22 near-exclusive relationship between AdX and --
23 near-exclusive relationship between Google Ads and AdX harms
24 competition. This is because with AWBid, Google Ads does
25 not bid on all impressions and it represents a small share

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1 of Google Ads' impressions transacted. Moreover, when
2 Google Ads bids on third parties, it wins at a far lower
3 rate than when it bids through AdX.

4 MS. WOOD: So if we could, pull up Plaintiffs'
5 Demonstrative Q, as in query.

6 BY MS. WOOD

7 Q And is this a demonstrative you prepared, Professor
8 Lee?

9 A It is.

10 Q And is this based on information from your report?

11 A It is.

12 Q And what data did you use to prepare Plaintiffs'
13 Demonstrative Q?

14 A So this is a sample of that June 2023 GAM log-level
15 data.

16 Q And can you tell us: What does this demonstrative
17 show?

18 A So it shows that when Google Ads bids through AdX, it
19 wins the impression 26 percent of the time. But when it
20 actually bids through a third-party exchange, it wins
21 1 percent of those impressions.

22 And one contributing factor is when Google Ads
23 bids through a third-party exchange, it charges a much
24 higher take rate or fee than when it bids through AdX. I
25 calculated using the data that through AWBid, the average

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1 margin that Google Ads takes is 32.5 percent. Whereas it's
2 much lower when it bids through AdX.

3 Q Let's look at Plaintiffs' Demonstrative R, as in Romeo.
4 There's a lot of material on this, and it's late in the day.
5 But we are almost close to the end, so let's muscle through
6 this together.

7 What does Plaintiffs' Demonstrative R show with
8 respect to the patterns you observed in the data of Google
9 Ads bidding on AdX versus Google Ads bidding on third-party
10 exchanges?

11 A So this demonstrative attempts to show why a higher
12 take rate or a higher margin charged when ads bids and
13 third-party exchanges can contribute to a lower win rate.

14 Q So let's take the top part first.

15 A Sure.

16 Q So from Google Ads to AdX, explain the math there,
17 please.

18 A So let's say an advertiser is starting off with a
19 dollar bid or spend into Google Ads and that Google Ads is
20 going to -- let's just make it simple, submits that on
21 behalf of the advertiser as a bid into AdX. Well, if Google
22 Ads takes a 15 percent rate, it means it's essentially
23 submitting an 85 percent bid into AdX. Now, if AdX takes
24 out a 20 percent, it means there's 68 cents that would be
25 bid into the publisher and into some final auction. Now, if

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1 Google Ads takes out instead of 32 percent when it bids via
2 AWBid, it's now bidding only 68 cents to a third-party
3 exchange, which means now the third-party exchange, if it
4 charged a lower take rate than 20 percent -- it could be 17
5 as one firm does or 8 percent as one firm does. Or even if
6 it we want all the way down to zero, it's not going to be
7 able to beat AdX. So all else equal, those other exchanges,
8 if they were to take any amount wouldn't be able to beat
9 AdX's bid. In all else equal, they would only win if AdX
10 wasn't bidding on, let's say, an incremental impression that
11 only they saw and AdX didn't.

12 Q And what does Plaintiffs' Demonstrative R tell you
13 about the effect of Google's anticompetitive conduct, in
14 particular the tie between Google Ads and AdX?

15 A Sorry. Can you repeat your question?

16 Q Yes. What does Plaintiffs' Demonstrative R tell you
17 about the effect of the anticompetitive conduct Google Ads'
18 unrestricted bidding on AdX versus other third-party
19 exchanges?

20 A So these exercises indicate the extent to which this
21 conduct has harmed rivals' competitiveness, has impeded
22 their ability to actually compete for publisher impressions
23 and advertiser spending. That is the restriction to certain
24 impression types, but also, this difference in fees is
25 making it difficult for customers to transact through other

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1 exchanges.

2 THE COURT: It's late in the day, so I may have
3 missed it. But why are you taking 32 percent of Google Ads
4 when it's going to the third-party exchange?

5 THE WITNESS: That's how much it charges for
6 remarketing impressions.

7 THE COURT: That's what's being charged?

8 THE WITNESS: Correct.

9 THE COURT: Okay.

10 BY MS. WOOD

11 Q And how do you know that, Professor Lee?

12 A So both from Google documents --

13 (Reporter clarification.)

14 THE WITNESS: And submissions to the DEC, as well
15 as my own independent calculations using data.

16 BY MS. WOOD

17 Q All right. So let's turn now to the second conduct
18 that you identified as having an anticompetitive effect,
19 which is the real-time bids from AdX being provided
20 exclusively to Google's own publisher ad server DFP. How,
21 if at all, did that conduct harm the ability of rival
22 publisher ad servers to compete on a fair basis for
23 customers?

24 A I'm sorry. There was a lot in there. Can you repeat
25 your question again?

Direct Examination - R. Lee

1 Q Sure. Talk to me about how the tie between AdX and DFP
2 harmed publishers, their rival publisher ad servers?

3 A Sure. So real-time bids from AdX are important for a
4 publisher ad server because that would allow the publisher
5 ad server to run auctions between AdX and other exchanges.
6 And that's an important way in which publishers can increase
7 their yield in monetization. By restricting access to those
8 real-time bids to other publisher ad servers, those
9 publisher ad servers aren't able to offer that to customers
10 impairing their ability to compete for those customers.
11 This matters because AdX represents an important source of
12 advertiser spend as some of my earlier quantitative analyses
13 show.

14 Q Now, relative to this point, let's look back at PTX
15 1395. And how does PTX 1395A reflect what you were just
16 describing?

17 A Yes. So this is one of the quantitative exercises I
18 was alluding to showing the relative difference in this
19 auction simulation where different exchanges were removed,
20 where AdX has a 50 times greater impact than publisher
21 payouts in this simulation than any other exchange.

22 Q And why would that negatively impact rival publisher ad
23 servers?

24 A Because if those rival publisher ad servers weren't
25 able to offer publishers real-time competition with AdX and

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1 these other exchanges, they would be at a relative
2 disadvantage to DFP.

3 Q Now, how, if at all, does the presence of what's been
4 described as AdX Direct affect your opinions about the tie
5 between AdX and DFP?

6 A So AdX Direct, which is a way in which rival publisher
7 ad servers can connect to AdX but not obtain real-time bids,
8 that presence does not change my opinion that this conduct
9 harmed competition. And that's because this connection is
10 not a replacement for real-time bids. It's not an effective
11 replacement.

12 Q I'm sorry?

13 A Effective.

14 Q It's not an effective replacement.

15 A And it represents a small share of AdX revenues. It's
16 not a meaningful exemption in that regards.

17 Q So you said it's not an effective replacement. Why do
18 you say that?

19 A Again, as I was describing, it doesn't allow a rival
20 publisher ad server to get those real-time bids from AdX and
21 run real-time auctions between AdX and other exchanges.

22 Q Well, if it doesn't allow them to get real-time bids,
23 what does it allow them to do?

24 A It allows them to submit basically a floor to AdX. AdX
25 will basically take it or leave it without reporting back.

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1 Q I'm sorry. I couldn't hear you. Take it or leave it?

2 A Take or it leave it and not report back the real-time
3 bid.

4 Q So isn't a take it or leave it sufficient for other
5 rival publisher ad servers to compete?

6 A Again, it's this benefit that comes about from having
7 different exchanges, different demand sources compete in
8 real-time, which we've seen happen in this industry where --
9 for example, with header bidding, having real-time
10 competition among exchanges -- whereas prior to that, they
11 were restricted to using the waterfall -- improved publisher
12 yield.

13 Q Okay. Let's's look at PTX 1302.

14 THE COURT: Any objection?

15 MS. WOOD: This is from Professor Lee's report.

16 MR. ISAACSON: No objection.

17 THE COURT: All right. It's in.

18 BY MS. WOOD

19 Q And what does PTX 1302 show, Professor Lee?

20 A So this is analysis of Google's data that plots the
21 fraction of AdX's worldwide revenue from indirect open-web
22 display that is going through AdX Direct. What's important
23 to note is that some of this AdX Direct revenue is actually
24 going to DFP publishers. So some DFP publishers were also
25 using AdX Direct.

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1 It's the non-DFP users which likely represents
2 those publishers using other publisher ad servers than DFP.
3 And you can see that this blue line for non-DFP users by
4 2023 represented less than 1 percent of AdX's worldwide
5 indirect open-web display revenue.

6 Q And what does that tell you, again, about this tie
7 between AdX and DFP?

8 A Well, it says that this real-time bidding
9 restriction -- even though there's AdX Direct -- doesn't
10 have many people using AdX outside of DFP.

11 Q Now, I want to turn to your last and final opinion,
12 which is about the harm that Google's conduct has caused to
13 its publisher and advertiser customers. How would your
14 conclusions with respect to harm to competition be impacted
15 if overall web display advertising volume had increased over
16 time?

17 A It wouldn't be affected.

18 Q And why not?

19 A Well, it's important to recognize that industries can
20 be growing in spite of anticompetitive conduct. Time trends
21 alone don't tell the complete story. There are many reasons
22 why overall display advertising spending can be increasing.
23 It includes more people using the Internet or buying things
24 online. That the industry is growing is in spite of
25 Google's exercise in market power and conduct.

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1 Q And did you reach any conclusions as to how Google's
2 conduct in the ad tech products at issue in this case had
3 the potential to harm everyday consumers?

4 A I did.

5 Q And what did you conclude?

6 A So consumers are likely harmed from reductions in
7 content available online arising from lower publisher
8 payouts, for example, sustained by higher ad tech fees.
9 Consumers can also be harmed if higher advertising prices
10 are passed through to higher retail prices.

11 Q All right. And what did you conclude with regard to
12 whether Google's conduct harmed its own customers,
13 publishers and advertisers?

14 A So I concluded that Google's conduct harmed open-web
15 publishers and advertisers in three ways:

16 First, by sustaining higher prices for transacting
17 open-web display ads. Higher prices would harm customers
18 leading to lower publisher payouts or higher advertising
19 prices.

20 Second, Google's conduct has reduced the quality
21 of options that customers had to transact open-web display
22 ads likely reducing the efficiency of the transactions that
23 occurred.

24 And third, Google's conduct likely reduced
25 innovation in the relevant markets.

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1 Q Now, what evidence supports your conclusion that higher
2 fees harm both advertiser and publisher customers?

3 A So I mentioned earlier evidence that in limited
4 circumstances in the past, Google was willing to reduce its
5 fees on its products when it faced greater competition
6 indicating with more competition, fees would be lower. And
7 fees for these products act similar to a tax and are borne
8 generally by both advertisers and open-web publishers.

9 Q And did you review any internal Google simulations that
10 examined this?

11 A I did. So these earlier experiments and simulations
12 related to Google Ads informed my opinion that higher fees
13 would be borne by both advertisers and publishers.

14 Q So let's look at PTX 858, which was already admitted
15 into evidence earlier.

16 Was this cited in your report?

17 A Yes. This is a document that we looked at earlier.

18 Q And if we can, look at the table on page 2 ending in
19 Bates stamp 247.

20 What is depicted here in this table?

21 A So this reports simulation experiment results for
22 changing Google Ads' margin or take rate on AdX web
23 publishers. And you can sort of see it on the left going
24 from 10 all the way to 25 percent. On the way right,
25 represent the change in payout, and you can see that as the

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1 fee goes up from 10 to 25, the payout falls. That's
2 consistent with publishers being harmed by increases in
3 fees.

4 I also used results from that earlier 2014 Google
5 Ads' experiment to calculate what the implied change in
6 advertising prices would be from an increase in Google Ads'
7 fee and found that advertise prices also would increase. So
8 this is consistent with both sets of customers being harmed
9 by an increase in fees.

10 Q And is that consistent with economic theory based on
11 your professional judgment?

12 A It is. This relates to that earlier point that this is
13 like a tax. These fees act like a tax that are borne by
14 both sides of this market.

15 Q All right. You can put that aside.

16 You indicated that the second way Google's own
17 publisher and advertiser customers might be harmed or were
18 harmed was through reduced quality of options. Can you
19 explain what you meant by that?

20 A Sure. So some of Google's conduct involved limiting
21 the pathways through customers -- through which customers
22 could transact these near-exclusive relationships. And
23 there was an earlier experiment where when Google Ads was
24 removed from AdX, many transactions were no longer matched.
25 There was no longer a sale. So that's consistent with these

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1 limitations imposed by Google's conduct likely leading to
2 fewer matches or harming the efficiency of advertisers
3 finding publishers to transact with.

4 Q And so did you find empirical evidence that Google's
5 own customers were harmed by this reduced quality?

6 A Well, I mentioned that there's that experiment which
7 spoke to the reduction in transactions. That would be
8 predicted to occur when AdX removed its bids from AdX.

9 Q And how is that consistent with reduced quality of
10 options for customers?

11 A Well, by options, I'm talking about -- the different
12 ways in which they can interact.

13 Q Now, the third element you mentioned of harm to
14 Google's customers was lack of innovation. Can you describe
15 what you mean by that?

16 A So Google's conduct reduced the benefits that is rivals
17 could expect to gain from innovation. That's because much
18 of its conduct impeded their ability to compete for spending
19 and for impressions.

20 Also, there's been notable exit in the markets.
21 We discussed Facebook Audience Network from the advertiser
22 ad network market and Verizon and OpenX from the publisher
23 ad server market. That represents a loss in innovation as
24 well due to exit.

25 Q Why do you say that exit of market participants is an

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1 indication of loss of invasion?

2 A Well, I mean, they're no longer available as options.
3 They're no longer available as competitors who can provide
4 additional product variety or product features to customers.

5 Q And finally, Professor Lee, did you reach conclusions
6 as to whether Google's conduct from earlier time period
7 still has competitive effects in the markets today?

8 A I did.

9 Q And what did you conclude in that regard?

10 A So three of the acts that I looked at, this
11 near-exclusive relationship between the ads and AdX, the
12 conditioning of real-time bids from AdX to DFP, and Unified
13 Pricing Rules still persist today, as well due to the
14 durability of network effects and scale effects and the exit
15 of competitors, the impact of all of Google's conduct still
16 persists.

17 MS. WOOD: Thank you. I'll pass the witness.

18 THE COURT: Well, I am going to give you-all a
19 break. I think it makes sense to start the cross tomorrow
20 morning since it's been a long day and this is technical
21 stuff.

22 So, Mr. Isaacson, you will start tomorrow morning.

23 MR. ISAACSON: Yes.

24 THE COURT: Professor, thank you. You will need
25 to be back here at 9:00 for cross-examination.

1 THE WITNESS: Thank you, Your Honor.

2 THE COURT: Let's go ahead and do our routine.

3 Unfortunately, I do have one matter at 8:30, so you, once
4 again, have to clear the desks. That should not take that
5 long. So I'm sure you will be able to get back in here by
6 ten to 9:00.

7 MS. WOOD: Thank you, Your Honor.

8 MR. TEITELBAUM: Your Honor, at the risk of
9 spoiling the early dismissal, I was wondering if I could
10 address just some brief undisputed exhibit issues that have
11 accumulated over the past 24 hours or so.

12 THE COURT: Undisputed?

13 MR. TEITELBAUM: Undisputed.

14 THE COURT: All right. That's fine.

15 MR. TEITELBAUM: The first is with regard to PTX
16 1385, which came in during the examination of Professor Lee,
17 I think we should also request from the Court that we have a
18 1385A for a redacted version.

19 THE COURT: That's fine.

20 MR. TEITELBAUM: Secondly, with respect to the
21 examination of Mr. Spencer yesterday, we had, on the Court's
22 instructions, conferred with Google about four exhibits that
23 were submissions to regulatory authorities about narrowing
24 the scope. And so we have reached agreement with Google
25 with respect to those four. We have hole-punched copies for

1 the Court. So at this time, pursuant to agreement with
2 Google, we would move into evidence as modified PTX 1092,
3 PTX 1093, PTX 1096, and PTX 1099.

4 MR. ISAACSON: Your Honor, over the lunch break, I
5 consulted with my colleagues about this issue, and we had
6 not yet reached agreement. So it's possible that
7 Mr. Teitelbaum is talking about developments that have
8 happened since lunch, but I am not aware of those. So I ask
9 for the opportunity to figure that out overnight.

10 MR. TEITELBAUM: No objection here. My note says
11 earlier this afternoon we reached agreement with Google,
12 which sounds like after the lunch break, but I am not in a
13 rush if Ms. Dunn wants to check.

14 THE COURT: There's too many lawyers in this case.
15 All right. That's fine. We will do it tomorrow.

16 MR. TEITELBAUM: Then the last two items, Your
17 Honor. We have two exhibits that we cited in our pretrial
18 findings of fact, which are also on the defense exhibit
19 list, which we would like to move in on that basis. Those
20 are PTX 946, which is also DTX 1020, and second is PTX 1031,
21 which is also DTX 723. And we also have hole-punched copies
22 for the Court and for counsel as well.

23 MS. DUNN: With the Court's indulgence, I would
24 just like to review.

25 THE COURT: Go ahead.

1 MS. DUNN: With respect to 946, Your Honor, PTX
2 946, no objection.

3 THE COURT: All right.

4 MS. DUNN: And 1031 no objection.

5 THE COURT: All right. They're both in.

6 MR. TEITELBAUM: So I take it we should still wait
7 on 1092 to 1099 just to make sure.

8 THE COURT: Yes.

9 MS. DUNN: Thank you, Your Honor.

10 THE COURT: All right.

11 THE COURT SECURITY OFFICER: Can the witness
12 leave?

13 THE COURT: Yes.

14 Ms. Dunn.

15 MS. DUNN: Your Honor, I do have a couple of
16 housekeeping items just about the trajectory of our case,
17 but I don't know if you would like to do exhibits first.

18 THE COURT: What do you have in mind?

19 MS. DUNN: So Google expects that we'll start our
20 case tomorrow as discussed earlier. Our first witness is
21 going to be Scott Sheffer. Depending on how much time
22 remains, given Dr. Lee's cross-examination and redirect, at
23 that time, we will either call another witness or seek to do
24 a read-in from Microsoft, which we -- it's probably by far
25 our most lengthy read-in. It's about an hour.

1 THE COURT: All right.

2 MS. DUNN: Obviously, a significant witness.

3 Then we anticipate at this point just for
4 planning -- and I know there are a lot of people that want
5 to know this is that our case will take until Wednesday or
6 Thursday of next week depending on the length of plaintiffs'
7 cross-examination.

8 THE COURT: All right. Now, let me just remind
9 you again. It's Tuesday night I think is the early -- we
10 are going to stop around 4:30 Tuesday.

11 MS. DUNN: Right.

12 THE COURT: Wednesday we have our same amount of
13 hours, but the lunch break is going to be earlier. It's
14 going to be a 12:00 to 1:00 lunch break, which makes the
15 afternoon much longer. So we'll have to see.

16 I know we are way ahead of schedule, and you've
17 done very well. So I may relax things slightly. Now,
18 again, there may be a rebuttal case, so I want to make sure
19 I don't get too far behind. But that's very good news.

20 Again, a lot of -- I suspect some of your case has
21 somewhat come in through cross-examination. A lot of the
22 concepts don't have to be rediscussed, you know, again.
23 Accumulative evidence is not favored.

24 MS. DUNN: Understood, Your Honor. We are very
25 mindful of that, and obviously, given the time frame, we are

1 trying very hard to not extend this longer than needed and
2 to not have accumulative evidence.

3 THE COURT: All right. Now the other thing to be
4 just thinking about is I think it makes sense, after all the
5 evidence comes, for there to be a break so that you, number
6 one, can prepare your revised findings of fact and
7 conclusions and have an opportunity to make closing
8 arguments.

9 MS. DUNN: Thank you, Your Honor.

10 THE COURT: I believe Judge Mehta did something
11 similar to that in D.C. I will permit the closing arguments
12 to be more than half an hour but don't expect a whole day.
13 Because, again, you know, I will have been looking at these
14 materials as we go.

15 MS. DUNN: Understood.

16 THE COURT: And we can talk about the scheduling
17 for that, you know, next week. That's my plan. I assumed
18 you had figured you wouldn't have to close.

19 MS. DUNN: We did not know, and we are happy for
20 the clarity. I think the Court is contemplating this, and I
21 assume that my friend on the other side would agree with
22 this. We just want an opportunity to confer with the Court
23 on the schedule for picking the date of the closing.

24 THE COURT: Definitely.

25 MS. DUNN: Thank you very much. We are grateful

1 for that.

2 THE COURT: All right. So we'll now read in those
3 exhibits that we believe were admitted today.

4 Let's let the folks leave for a second.

5 (Discussion off the record.)

6 THE COURT: There you go. Okay.

7 THE COURTROOM DEPUTY: DTX 2532, DTX 2532A, DTX
8 2533, DTX 2533A, DTX 2066, DTX 2066A, PTX 695, PTX 904, PTX
9 1507, PTX 468, PTX 285, PTX 239, PTX 234, PTX 275, PTX 470,
10 PTX 1543, PTX 453, PTX 403, PTX 367, PTX 639, PTX 429, PTX
11 438, PTX 452, PTX 502, PTX 631, PTX 712, PTX 507, PTX 786,
12 PTX 882, PTX 945, PTX 1021, PTX 794, PTX 1107, PTX 1108, PTX
13 579, PTX 103, PTX 1778, PTX 1278, PTX 1278A, PTX 188, PTX
14 1393, PTX 1393A, PTX 1395, PTX 1395A, PTX 1258, PTX 1259,
15 PTX 1238, PTX 1238A, PTX 1261, PTX 1261A, PTX 1292, PTX
16 1292A, PTX 1294, PTX 1294A, PTX 1242, PTX 1231, PTX 1232,
17 PTX 1235, PTX 1385, PTX 1385A, PTX 1808, PTX 1444, PTX
18 1444A, PTX 1243, PTX 1243A, PTX 1269, PTX 1269A, PTX 657,
19 PTX 1389, PTX 1389A, PTX 1403, PTX 1403A, PTX 1302, PTX 946,
20 PTX 1031.

21 MS. WOOD: That's what we have, Your Honor.

22 MR. ISAACSON: So I had a couple of discrepancies.
23 So just to check.

24 (Counsel confer.)

25 THE COURT: All right. So we're all

1 right, Ms. Dunn?

2 MS. DUNN: Yes. Thank you, Your Honor.

3 THE COURT: All right. Very good.

4 If there's nothing further, then we'll recess
5 court until 8:30 tomorrow morning.

6 (Proceedings adjourned at 5:53 p.m.)

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23 I certify that the foregoing is a true and
24 accurate transcription of my stenographic notes.

25

/s/
Rhonda F. Montgomery